MEMORANDUM

Subject: Response to Public Comments on Proposed Stationary Combustion Turbines NESHAP

From: Sims Roy, ESD Combustion Group

To: Robert Wayland, ESD Combustion Group

On January 14, 2003, the EPA proposed national emission standards for hazardous air pollutants (NESHAP) for stationary combustion turbines (68 FR 1888). The proposed rule fulfills the requirements of section 112(d) of the Clean Air Act (CAA). The purpose of this document is to present a summary of the public comments that EPA received on the proposed standards and the responses developed by EPA. This summary of comments and responses serves as the basis for revisions made to the standards between proposal and promulgation.

The EPA received 75 public comments on the proposed rule. A listing of all persons submitting comments, their affiliation, and the document number for their comments is presented in Table 1. The comments can be obtained online from the EPA's Edocket website (http://www.epa.gov/edocket). The Edocket number for this rulemaking is OAR-2002-0060. The comments can also be obtained from the paper docket, docket number A-95-51. Each commenter has two document numbers, one number is the Edocket Document ID, and the other document number is for the paper (legacy) document numbering system. In this document, commenters are identified by the last three digits of the Edocket Document ID of their comments.

On January 29, 2003, a public hearing on the proposed NESHAP for stationary combustion turbines (CTs) was held at the EPA facility in Research Triangle Park, NC. Six speakers presented comments on the proposed rule and are listed at the end of Table 1. All of the commenters except one supplemented their comments at the public hearing with written comments submitted to the docket. Any comments from the public hearing that were not included in the written comments submitted to the docket are also summarized in this document. A transcript of the public hearing is available from the Edocket website (document ID OAR-2002-0060-0541).

Table 1. List of Commenters on the Proposed NESHAP for Stationary Combustion Turbines

EDocket ID Number	Legacy Document Number	Commenter, Addressee, Title or Description, etc.	Date of Document
OAR-2002-0060-0385	IV-D-01	J. Bardi, Administrative Assistant, ASTM International, W. Conshohocken, PA.	01/21/2003
OAR-2002-0060-0386	IV-D-02	S. Clowney, El Paso Pipeline Group.	12/19/2002
OAR-2002-0060-0387	IV-D-03	L. Eagan, Chair, STAPPA Air Toxics Committee and R. Colby, Chair, ALAPCO Air Toxics Committee, Washington, DC.	01/29/2003
OAR-2002-0060-0412	IV-D-06	G. M. Adams, Assistant Departmental Engineer, Office Engineering Department, The Los Angeles County Sanitation Districts (LACSD), Whittier, CA.	02/12/2003
OAR-2002-0060-0413	IV-D-52	W. E. Corbin, Private Citizen, Saylorsburg, PA.	Undated
OAR-2002-0060-0414	IV-D-04	D. M. Anthony, Air Quality Engineer, Alyeska Pipeline Service Company, Fairbanks, AK.	02/08/2003
OAR-2002-0060-0415		jeanpublic@yahoo.com	Undated
OAR-2002-0060-0416	IV-D-53	D. R. Schregardus, Deputy Assistant Secretary of the Navy (Environment), Washington, DC.	02/19/2003
OAR-2002-0060-0417	IV-D-54	J. C. Solt, Lindh & Assoc., Comments on behalf of Catalytica Energy Systems, Antelope, CA.	02/10/2003
OAR-2002-0060-0418	IV-D-55	N. Popa, Senior Environmental Planner, CMS Energy/Consumers Energy, Jackson, MI.	02/27/2003
OAR-2002-0060-0419	IV-D-56	M. Murray, Director Environmental & Safety Policy, Sempra Energy, San Diego, CA.	02/28/2003

EDocket ID Number	Legacy Document Number	Commenter, Addressee, Title or Description, etc.	Date of Document
OAR-2002-0060-0420	IV-D-25	J. Shefchek, Managing Director and Chief Environmental Officer, Wisconsin, Power and Light Company, Alliant Energy, Madison, WI.	02/27/2003
OAR-2002-0060-0421	IV-D-31	B. Rising, Regulatory Affairs Manager, Siemens Westinghouse Power Corp., Orlando, FL.	02/27/2003
OAR-2002-0060-0422	IV-D-23	R. J. Morehouse, ExxonMobil, Houston, TX.	02/27/2003
OAR-2002-0060-0423	IV-D-57	M. C. Frank, Director of Regulatory Affairs, The Boeing Company, VA.	02/28/2003
OAR-2002-0060-0424	IV-D-58	J. M. Vaught, Chair, Subcommittee on Environment & Fuels and L. Witherspoon, Chair, Environmental & Regulatory Affairs, ASME Gas Turbine Procurement Subcommittee on Environment and Fuels and IGTI Environmental and Regulatory Affairs Technical Committee.	02/28/2003
OAR-2002-0060-0425	IV-D-46	C. Van Atten, The Clean Energy Group, Concord, MA.	02/28/2003
OAR-2002-0060-0426	IV-D-48	M. S. Brownstein, Director Environmental Strategy & Policy, Public Service Enterprise Group, Newark, NJ.	02/28/2003
OAR-2002-0060-0427	IV-D-59	L. Witherspoon, Solar Turbines Inc., San Diego, CA.	02/27/2003
OAR-2002-0060-0428	IV-D-60	D. M. Chari, Senior Environmental Manager, Rohm and Haas Company, Philadelphia, PA.	02/28/2003
OAR-2002-0060-0429	IV-D-61	J. P. LaCosse, President and Principal Scientist, Spectral Insights LLC, Durham, NC.	02/28/2003

EDocket ID Number	Legacy Document Number	Commenter, Addressee, Title or Description, etc.	Date of Document
OAR-2002-0060-0430	IV-D-49	D. J. Jezouit, Counsel to the Class of '85 Regulatory Response Group, Baker Botts LLP, Washington, DC.	02/28/2003
OAR-2002-0060-0431	IV-D-62	J. C. deRuyter, Principal Consultant, DuPont Engineering Technology, Wilmington, DE.	02/28/2003
OAR-2002-0060-0433	IV-D-44	D. Kolaz, Chief, Bureau of Air, Illinois Environmental Protection Agency, Springfield, IL.	02/27/2003
OAR-2002-0060-0435	IV-D-26	S. D. Meyers, Counsel-Environment, Health & Safety, GE Power Systems, Schenectady, NY.	02/28/2003
OAR-2002-0060-0436	IV-D-40	M. Klassen, Vice President/Principal Research Engineer, Combustion Science & Engineering Inc., Columbia, MD.	02/28/2003
OAR-2002-0060-0437	IV-D-63	T. Steichen, American Petroleum Institute, Washington, DC.	02/28/2003
OAR-2002-0060-0438	IV-D-47	T. R. Weeks, Chief, Engineering, San Diego County Air Pollution Control District, Air Pollution Control Board, San Diego, CA.	02/28/2003
OAR-2002-0060-0439	IV-D-64	S. E. Woock, Federal Regulatory Affairs Manager, Weyerhaeuser, New Bern, NC.	02/28/2003
OAR-2002-0060-0440	IV-D-66	J. Michael Geers, Cinergy Corp, Cincinnati, OH.	02/28/2003
OAR-2002-0060-0442	IV-D-65	J. Dreyer, Director of Industry Affairs, Gas Processors Association, Tulsa, OK.	02/28/2003
OAR-2002-0060-0443	IV-D-72	G. Calvo, Hunton & Williams, Comments of the Utility Air Regulatory Group, Washington, DC.	02/28/2003

EDocket ID Number	Legacy Document Number	Commenter, Addressee, Title or Description, etc.	Date of Document
OAR-2002-0060-0444	IV-D-67	C. Levesque, Supervisor Permits Section, City Public Service, San Antonio, TX.	02/28/2003
OAR-2002-0060-0445	IV-D-68	J. Whynot, Planning and Rules Manager, South Coast Air Quality Management District, Diamond Bar, CA.	02/28/2003
OAR-2002-0060-0446	IV-D-69	E. H. McMeekin, Environmental Manager, PPG Industries, Allison Park, PA.	02/28/2003
OAR-2002-0060-0447 & OAR-2002-0060-0448	IV-D-70	G. S. Lipka, Earth Tech.	02/28/2003
OAR-2002-0060-0449	IV-D-41	L. Beal, Director, Environmental Affairs, The Interstate Natural Gas Association of America, Washington, DC.	02/28/2003
OAR-2002-0060-0460	IV-D-21	J. Abboud, Executive Director, Gas Turbine Association, Great Falls, VA.	02/28/2003
OAR-2002-0060-0463	IV-D-16	P. Chu, EPRI, Palo Alto, CA.	02/26/2003
OAR-2002-0060-0464	IV-D-18	P. T. Cavanaugh, Vice President Federal and International Government Relations, ChevronTexaco, Washington, DC.	02/28/2003
OAR-2002-0060-0465	IV-D-17	J. T. Higgins, Director, Bureau of Stationary Sources, Division of Air Resources, New York State Department of Environmental Conservation, Albany, NY.	02/27/2003
OAR-2002-0060-0469	IV-D-20	C. Waxman, Senior Environmental Scientist, Environmental Engineering and Compliance, KeySpan, Hicksville, NY.	02/28/2003

EDocket ID Number	Legacy Document Number	Commenter, Addressee, Title or Description, etc.	Date of Document
OAR-2002-0060-0470	IV-D-08	R. R. Scott, Chief Air Programs Manager, Air Resources Division, New Hampshire Department of Environmental Services, Concord, NH.	02/12/2003
OAR-2002-0060-0471	IV-D-11	N. L. Pospisil, Director, Safety, Health & Environment, Calpine Corp., Folsom, CA.	02/13/2003
OAR-2002-0060-0472	IV-D-12	J. Pew, EarthJustice, Washington, DC.	02/13/2003
OAR-2002-0060-0473	IV-D-19	D. M. Shea, ENSR International, Westford, MA.	02/28/2003
OAR-2002-0060-0474	IV-D-27	B. H. Spooner, Senior Engineer, Environmental Services, Municipal Electric Authority of Georgia (MEAG Power), Atlanta, GA.	02/27/2003
OAR-2002-0060-0475	IV-D-28	D. R. Adams, Air Quality Specialist, WE Energies, Milwaukee, WI.	02/27/2003
OAR-2002-0060-0476	IV-D-22	R. J. Barkanic, Manager-Environmental, PPL Services Corp., Allentown, PA.	02/28/2003
OAR-2002-0060-0477	IV-D-32	S. A. Knis and G. G. Gaetke, The Dow Chemical Company, Freeport, TX.	02/24/2003
OAR-2002-0060-0478	IV-D-29	L. Murphy, Vice President Safety & the Environment, Manufacturing Division, Merck & Co. Inc., Whitehouse Station, NJ.	02/27/2003
OAR-2002-0060-0479	IV-D-30	P. F. Faggert, Vice President and Chief Environmental Officer, Dominion Generation, Glen Allen, VA.	02/28/2003
OAR-2002-0060-0481	IV-D-37	A. Wright, Director, Environmental Management, Dayton Power and Light Company (DPL), Dayton, OH.	02/28/2003
OAR-2002-0060-0482	IV-D-39	C. R. Wakild, Progress Energy, Raleigh, NC.	02/28/2003

EDocket ID Number	Legacy Document Number	Commenter, Addressee, Title or Description, etc.	Date of Document
OAR-2002-0060-0483	IV-D-35	A. R. Newman, Washington State Department of Ecology, Olympia, WA.	02/28/2003
OAR-2002-0060-0484	IV-D-36	R. Bessette, President, Council of Industrial Boiler Owners, Washington, DC.	02/28/2003
OAR-2002-0060-0485	IV-D-38	R. Poteet, ConocoPhillips Alaska Inc.	02/28/2003
OAR-2002-0060-0486	IV-D-34	B. Machaver, Private Citizen.	02/28/2003
OAR-2002-0060-0487	IV-D-71	A. E. Smith Jr., Senior Vice President & Environmental Counsel, Portside Energy Corp. (PEC), Merrilville, IN.	02/28/2003
OAR-2002-0060-0488	IV-D-42	D. T. Riley, Vice President, Government Community and Industrial Relations, Tesoro Petroleum Companies, Auburn, WA.	02/28/2003
OAR-2002-0060-0489	IV-D-33	M. M. Round, Senior Air Toxics Program Analyst, Northeast States for Coordinated Air Use Management (NESCAUM), Boston, MA.	02/27/2003
OAR-2002-0060-0501	IV-D-45	D. L. Kraisinger, Vice President, Health Safety & Environment, BP America Inc., Los Angeles, CA.	02/27/2003
OAR-2002-0060-0502	IV-D-50	J. J. Mayhew, Vice President Regulatory & Technical Affairs, The American Chemistry Council, Arlington, VA.	02/28/2003
OAR-2002-0060-0504	IV-D-43	R. S. Bahnick, Vice President, Operations and Technical Support, Southern Star Central Gas Pipeline Inc., Owensboro, KY.	02/26/2003
OAR-2002-0060-0505	IV-D-51	M. G. Helm, Environmental Consultant, Conectiv Energy, Newark, DE.	02/28/2003

EDocket ID Number	Legacy Document Number	Commenter, Addressee, Title or Description, etc.	Date of Document
OAR-2002-0060-0508	IV-G-01	T. Pugh, Manager Environmental Services, American Public Power Association,	03/04/2003
OAR-2002-0060-0509	IV-D-73	R. Meyer, Manager of Environmental Affairs, American Municipal Power-Ohio (AMP-Ohio), Columbus, OH.	02/27/2003
OAR-2002-0060-0513	IV-D-05	O. M. Dominguez, Director, Environmental Management Division, National Aeronautics and Space Administration, Headquarters, Washington, DC.	02/06/2003
OAR-2002-0060-0514	IV-D-07	J. A. Paul, Supervisor, Regional Air Pollution Control Agency, Dayton, OH.	02/11/2003
OAR-2002-0060-0515	IV-D-09	L. Eagan, Director, Bureau of Air Management, State of Wisconsin, Department of Natural Resources, Madison, WI.	01/07/2003
OAR-2002-0060-0516	IV-D-10	J. F. Metzger, Sr. Environmental Specialist, 3M Environmental Technology and Safety Services, St. Paul, MN.	02/12/2003
OAR-2002-0060-0517	IV-D-13	E. W. Repa, Director Environmental Programs, National Solid Wastes Management Association, Washington, DC.	02/12/2003
OAR-2002-0060-0518	IV-D-14	W. O'Sullivan, Acting Director, State of New Jersey Department of Environmental Protection, Trenton, NJ.	02/14/2003
OAR-2002-0060-0519	IV-D-15	N. Dee, Director of Environment and Safety, National Petrochemical & Refiners Association, Washington, DC.	02/26/2003
OAR-2002-0060-0520	IV-D-24	P. A. Lacey, Senior Managing Counsel, American Gas Association, Washington, DC.	02/28/2003

EDocket ID Number	Legacy Document Number	Commenter, Addressee, Title or Description, etc.	Date of Document
OAR-2002-0060-0541 (transcript of public hearing)		Speakers were: (A) W. F. Priebe, representing Alaska North Slope Oil and Gas Production and Transmission Operators. (B) C. Wait, Panhandle Pipe Line Companies, on behalf of the Interstate Natural Gas Association of America. (C) S. Clowney, El Paso Pipeline Group, on behalf of the Interstate Natural Gas Association of America. (D) L. Witherspoon, Manager, Environmental Programs, Solar Turbines Inc., San Diego, CA. (E) B. Nicholson, Chief of the Planning Section, NC Division of Air Quality, on behalf of the State and Territorial Air Pollution Program Administrators and the Association of Local Air Pollution Control Officials. F) S. Lanier, American Petroleum Institute.	

Many commenters expressed support for the comments submitted by other commenters. Table 2 shows those commenters and the comments that they supported.

Table 2. List of Commenters Expressing Support for Other Comments

Commenter	Supports Comments of:
OAR-2002-0060-0501	OAR-2002-0060-0437, OAR-2002-0060-0502
OAR-2002-0060-0464	OAR-2002-0060-0437, OAR-2002-0060-0502
OAR-2002-0060-0484	OAR-2002-0060-0431, OAR-2002-0060-0502
OAR-2002-0060-0482	OAR-2002-0060-0443

Commenter	**Supports Comments of:**
OAR-2002-0060-0481	OAR-2002-0060-0430, OAR-2002-0060-0443
OAR-2002-0060-0479	OAR-2002-0060-0443, OAR-2002-0060-0449
OAR-2002-0060-0478	OAR-2002-0060-0502
OAR-2002-0060-0477	OAR-2002-0060-0502
OAR-2002-0060-0475	OAR-2002-0060-0443
OAR-2002-0060-0474	OAR-2002-0060-0443, OAR-2002-0060-0508
OAR-2002-0060-0428	OAR-2002-0060-0484, OAR-2002-0060-0502, National Association of Manufacturers
OAR-2002-0060-0446	OAR-2002-0060-0502
OAR-2002-0060-0442	OAR-2002-0060-0449
OAR-2002-0060-0431	OAR-2002-0060-0502
OAR-2002-0060-0444	OAR-2002-0060-0508
OAR-2002-0060-0427	OAR-2002-0060-0449
OAR-2002-0060-0418	OAR-2002-0060-0443, OAR-2002-0060-0449
OAR-2002-0060-0508	OAR-2002-0060-0443
OAR-2002-0060-0509	OAR-2002-0060-0443, OAR-2002-0060-0508
OAR-2002-0060-0422	OAR-2002-0060-0437, OAR-2002-0060-0502
OAR-2002-0060-0440	OAR-2002-0060-0443
OAR-2002-0060-0519	incorporates by reference OAR-2002-0060-0502's comments supporting EPA's Flexibility in promulgating NESHAPs. Those comments appear in Section I of OAR-2002-0060-0502.
OAR-2002-0060-0520	OAR-2002-0060-0449

The summary of public comments and responses is organized as follows:

I. Applicability
   - A. Applicability Cutoff
   - B. Emission Factors
   - C. Subcategories with Limited Requirements

1. Limited Use
2. Digester Gas, Landfill Gas, and Other Gaseous Fuels
3. Other

D. Delisting
E. Other

II. Definitions
A. Lean Premix Stationary Combustion Turbine
B. Emergency Stationary Combustion Turbine
C. Stationary Combustion Turbine
D. Major Source
E. Other

III. Dates

IV. MACT
A. MACT Floor and MACT for Diffusion Flame Units
B. MACT Floor and MACT for Lean Premix Units
C. MACT Floor and MACT for Other Subcategories
D. Other

V. Emission Limitations
A. Formaldehyde
B. CO
C. Duct Burners
D. Other

VI. Monitoring, Recordkeeping, Reporting
A. CO CEMS
B. Performance Testing
C. Other

VII. Test Methods
A. Formaldehyde
1. CARB 430
2. FTIR/EPA Method 320
3. EPA SW-846 Method 0011
4. EPA Method 323
5. Other

B. CO
1. CEMS
2. EPA Method 10

VIII. Cost/Impacts

IX. Risk

X. Other
A. Startup/Shutdown
B. Dual Fuel Units
C. Oil Firing
D. Duct Burners
E. Other

I. APPLICABILITY

A. Applicability Cutoff

I.A.1 Comment: Eight commenters (420, 425, 426, 428, 430, 431, 433, 502) expressed support for the subcategory for turbines with a rated peak power output of less than 1 megawatt (MW).

Response: The EPA acknowledges the commenters' support. A subcategory for these units has been retained in the final rule.

I.A.2 Comment: Nine commenters (414, 437, 442, 444, 449, 479, 485, 501, 508, 509) believed that the EPA should increase the 1 MW capacity threshold. Three commenters (501, 485, 437) said that EPA should exclude from regulation all turbines rated less than 10 MW. Three commenters (444, 508, 509) recommended that EPA create a subcategory for units with a capacity of 25 MW or less and set no maximum achievable control technology (MACT) standard for such units. Three commenters (437, 449, 442) said that the size applicability criteria should be adjusted to be consistent with the MACT floor.

Response: The EPA is aware of stationary combustion turbines as small as 3 MW that are equipped with add-on HAP control devices. Therefore, EPA does not have the discretion to create a subcategory for units with a capacity of 25 MW or less (or 10 MW or less) and set no maximum achievable control technology (MACT) standard for such units. Although 3 MW is the smallest size unit that is known to have add-on HAP control, EPA feels it is appropriate to set the cutoff for inclusion in the less than 1 MW rated peak power subcategory at 1 MW because it is believed that the control technology used for 3 MW units can be transferred to units as small as 1 MW in size.

I.A.3 Comment: One commenter (438) said that the rule should be explicit as to whether the 1 MW capacity level for inclusion in the less than 1 MW rated peak power subcategory applies to an individual CT or applies to the aggregate capacity of a group of CTs, including two or more CTs that have a common add-on air pollution control device.

Response: The EPA intended for the 1 MW capacity level to apply to an individual CT, not the aggregate capacity of a group of CTs. This clarification has been made in the final rule.

I.A.4 Comment: Nine commenters (418, 424, 427, 437, 442, 449, 487, 501, 502) recommended that EPA provide an emission threshold as an alternative applicability cutoff. Eight (418, 424, 427, 437, 442, 449, 501, 502) of those commenters recommended that the emission threshold should be set at less than 1 ton per year of formaldehyde emissions. One commenter (487) suggested that EPA should include a greater than 2 tons per year formaldehyde applicability requirement.

Response: The basis for this comment is the Oil and Natural Gas Production and Natural Gas Transmission and Storage NESHAP (promulgated on June 17, 1999). In that rule, HAP emissions from process vents at glycol dehydration units that are located at major HAP sources and from process vents at certain area source glycol dehydration units are required to be controlled unless the actual flowrate of natural gas in the unit is less than 85,000 m^3/day (3.0 MMSCF/D), on an annual average basis, or the benzene emissions from the unit are less than 0.9 Mg/yr (1 tpy). The 1 ton per year emission threshold in the Oil and Natural Gas Production and Natural Gas Transmission and Storage MACT is equivalent to the smallest size glycol dehydration unit with control of HAP emissions and is therefore based on equivalence, not risk. EPA does not have the discretion to provide an alternative applicability cutoff based on risk.

I.A.5 Comment: One commenter (502) expressed the view that despite the *National Lime II* and *CKRC* cases, EPA has not lost any of its discretion to establish applicability criteria that define the source category and the units subject to a MACT standard. The commenter felt that EPA should revisit its decision that it does not have *de minimis* authority, and EPA's interpretation, discussed in *National Lime II*, that it lost its inherent authority to relieve burdens of regulation where they yield trivial or no value is based on an incorrect analysis of the wrong provision of the statute. The commenter suggested that EPA should not take such a restrictive position on its *de minimis* authority.

Response: It is not necessary for EPA to assert the *de minimis* authority which the commenter claims EPA possesses. The EPA's discretion to establish appropriate subcategories based on the characteristics of sources within the source category is sufficient to provide relief from the burdens of regulation.

B. Emission Factors

I.B.1 Comment: Eleven commenters (414, 420, 422, 427, 430, 437, 442, 449, 474, 485, 501) expressed the view that the emission factors presented in Table 1 of the preamble should be removed, or wording should be added to acknowledge the use of factors from other sources. Three of those commenters (427, 442, 449) said that EPA should not dictate emission factors for major source determination; owner/operators should be allowed to determine appropriate emission factors for their facility.

Two commenters (427, 449) expressed concern with the quality of the emissions data and methodology used to develop the emission factors presented in Table 1 of the preamble. Those commenters also stated that the emission factors for all loads in Table 1 of the preamble do not accurately reflect the emission profiles for turbines in variable load applications. One commenter (412) stated that all existing turbines do not fit the emissions mold projected in Table 1.

Response: The EPA agrees and has removed Table 1 from the preamble. Table 1 was intended to simplify major source determination, e.g., facilities would not have to develop their own emission factors. The EPA agrees that all turbines may not fit the emissions mold projected

in Table 1. The use of the emission factors in Table 1 was intended to be optional; EPA did not intend to dictate the use of these emission factors.

The emission factors in Table 1 of the preamble to the proposed rule were based on emissions data from test reports that were reviewed and accepted by EPA according to a common set of acceptance criteria. However, EPA received several comments regarding the quality of its emissions data and as a result, performed an extensive review of tests used at proposal and new tests received during the comment period. This review is discussed in greater detail in the response to comment V.A.1. As a result of this review, revised emission factors for stationary combustion turbines were calculated and are presented in the memorandum "HAP Emission Factors for Stationary Combustion Turbines," which can be found in the rule docket. This memo has emission factors for both high load and all load conditions; the emission standards in this rule are based on data for high loads.

Many public comments were received demonstrating that formaldehyde emissions measured using CARB Method 430 or EPA Method 0011 were biased low compared to FTIR measurements. Caution should therefore be used when using data collected using CARB 430 or EPA Method 0011 in determining applicability. The EPA believes that the emission factors presented in the "HAP Emission Factors for Stationary Combustion Turbines" memorandum provide the most accurate information on stationary combustion turbine emission factors.

I.B.2 Comment: One commenter (412) stated that the emission factors in Table 1 of the preamble do not account for diesel particulate toxicity.

Response: The commenter is correct, the emission factors in Table 1 of the preamble are not adjusted for toxicity. The emission factors in Table 1 were on a mass per heat input basis. The emission factors in Table 1 have not been included in the final rule, therefore, the comment is moot. However, as discussed in the reply to comment I.B.1, revised emission factors are presented in a memorandum which can be found in the rule docket.

I.B.3 Comment: Four commenters (420, 430, 471, 474) requested that EPA clarify that the factors are applicable for the total aggregate hazardous air pollutants (HAPs) that can be expected from a single CT. Two of those commenters (420, 430) suggested that EPA should provide emission factors for individual HAPs so that sources can determine whether they will be a major source based on the threshold of 10 tons per year of a single HAP.

Response: The emission factors have not been included in the final rule, therefore, the first comment is moot. Emission factors for individual HAPs can be found in a memorandum available from the rulemaking docket, as discussed in the reply to comment I.B.1. This document can be obtained from the EPA's Edocket website.

I.B.4 Comment: One commenter (471) asserted that EPA should include the emission factors in Table 1 of the preamble in the definitions under § 63.6085 if EPA intends to require the use of these factors as the basis of determining applicability to a particular source.

Response: The emission factors in Table 1 have not been included in the final rule, therefore, the comment is moot.

I.B.5 Comment: One commenter (474) stated that the final rule should clarify whether the emission factors in Table 1 of the preamble can also be used to determine HAP emissions from associated duct burners.

Response: The emission factors in Table 1 did not include emissions from duct burners; therefore they should not be used to determine HAP emissions from duct burners. The emission factors in Table 1 have not been included in the final rule, therefore, the comment is moot.

C. Subcategories with Limited Requirements

1. Limited Use

I.C.1.1 Comment: Twenty-four commenters (414, 416, 420, 422, 423, 430, 431, 437, 440, 442, 443, 444, 449, 474, 475, 476, 479, 482, 485, 501, 502, 508, 509, 519) supported the creation of a subcategory for limited use CTs with a capacity utilization of 10 percent or less. One commenter (416) expressed the view that the limited use subcategory should apply to all limited use CTs, not just electric power peak shaving units.

One commenter (414) requested that EPA define what is meant by a capacity utilization of 10 percent or less. Two commenters (440, 475) stated that the basis should be no more than 10 percent utilization during the previous three calendar years and no more than 20 percent in each of those years. Two commenters (443, 482) said that the 10 percent capacity utilization should be based on a three-year average. One of those commenters (443) believed that a CT should only trigger MACT if it exceeds 2,628 hours in any three year period, and that EPA should consider creating a sliding scale in which the limited use cutoff could exceed 876 hours if a unit's formaldehyde emissions are below a certain level.

Six commenters (414, 421, 433, 479, 484, 519) requested that EPA increase the allowable operating time for limited use turbines. Commenter 414 recommended that the 50 hour allowance for limited use be increased to 200 hours to allow for maintenance checks. Commenters 421 and 433 stated that a more appropriate cut-off is 500 hours per year, which Commenter 433 said is consistent with EPA policy for designating emergency engines for Title V permits and is also appropriate because year-to-year variability in the utilization does not result in routine changes in a unit's status. Commenter 433 also suggested that EPA could develop a more refined approach; for example, the cutoff for turbines greater than 10 MW could be 200 hours per year.

Commenter 519 said that if a 10 percent utilization is not implemented, the testing of CTs to assure the unit will be operational when needed should be excluded from the operating limit, because these testing operations can range from weekly testing for more than one hour to several times each month.

One commenter (481) said that EPA should consider an expanded limited use category for simple cycle CTs that are permitted as synthetic minors, because the cost of control per ton of HAP reduced for simple cycle units would be very high. One commenter (430) said that EPA should create an expanded limited use subcategory for simple cycle CTs operated at capacity factors of up to 30 percent.

Two commenters (465, 470) contended that the subcategorization of limited use CTs without controls is not protective of public health, because these CTs operate mostly in the summer months when the public is more likely to be exposed to the emissions.

Two commenters (465, 470) remarked that any subcategorization of limited use CTs should include a permit requirement that these units operate less than 876 hours per year. To lower costs for these units, less onerous monitoring requirements such as periodic stack tests with a temperature sensor on the catalyst could be required.

Three commenters (426, 431, 502) supported the subcategory for limited use units and EPA's finding that no emission reduction should be required for these units.

One commenter (423) said that if EPA does not increase the allowable operating hours for a limited use unit to 876, EPA should subcategorize and delist the special limited use activity of a turbine that is a stationary mounted aircraft engine to provide motive force for a wind tunnel.

One commenter (518) expressed the view that existing limited use CTs might be exempted from the MACT emission limits, but new limited use CTs should not be exempted. The commenter observed that in New Jersey, limited use units generally operate for less than 250 hours per year.

Response: The preamble for the proposed rule proposed a subcategory for limited use stationary CTs and defined them as operating 50 hours or less per calendar year. The EPA solicited comments on creating a subcategory of limited use stationary CTs with capacity utilization of 10 percent or less and used for electric power peak shaving; numerous commenters supported the creation of such a subcategory. Comments were received both for and against the limited use subcategory. After considering all of the comments, EPA has decided not to include a subcategory for limited use stationary CTs in the final rule. Several commenters indicated that a limit of 50 hours was so low that most turbines would exceed the operating limit through the operation of the turbine for routine testing and maintenance. Therefore, it is believed that no turbines would utilize the limit of 50 hours. A subcategory of limited use stationary CTs with capacity utilization of 10 percent or less and used for electric power peak shaving was not created because these sources are similar sources to units equipped with add-on oxidation catalyst control and their operation only during peak periods does not preclude them from being equipped with add-on oxidation catalyst control.

Our objective in subcategorizing is not to protect public health, but to establish groups of

sources which share common characteristics that are related to the availability of potential emission control strategies. In any case, EPA has not adopted a limited use subcategory, because EPA determined that creation of such a subcategory would not change the nature of the required controls.

2. Digester Gas, Landfill Gas, and Other Gaseous Fuels

I.C.2.1 Comment: Seven commenters (420, 426, 430, 431, 433, 502, 517) expressed support for the subcategory for turbines firing landfill gas or digester gas.

Response: The EPA acknowledges the commenters' support; this subcategory has been retained in the final rule.

I.C.2.2 Comment: One commenter (517) noted that EPA should not develop NESHAP for landfill gas fired CTs because turbines are one of the control technologies mandated by the Municipal Solid Waste Landfill NESHAP (68 FR 2227). As such, EPA should not be regulating control devices with control devices.

Response: The EPA does not believe that control devices utilized to reduce HAP emissions should by themselves be deemed to be an affected source for the purpose of MACT standard development. However, the EPA also does not believe that the mere fact that a source which emits HAP may also be utilized to address other environmental problems is a sufficient basis to exempt that source entirely from inclusion in a standard.

I.C.2.3 Comment: One commenter (413) remarked that primary fuel is not defined in the rule. The commenter noted that applying the subcategory only to turbines using landfill or digester gas as primary fuel is overly restrictive. The commenter suggested that the subcategory should be for turbines with annual landfill and digester gas consumption 10 percent or more of the total fuel consumption on an annual basis based on gross heat input (similar to the boiler NSPS in 40 CFR 60 Subpart Db).

Response: The EPA agrees that it is appropriate to provide guidelines for the usage of landfill and digester gas, and is incorporating the commenter's suggestion that the subcategory should be for turbines with annual landfill and digester gas consumption 10 percent or more of the gross heat input on an annual basis. The EPA believes that firing greater than 10 percent landfill or digester gas will cause fouling that will render an oxidation catalyst inoperable within a short period of time. This belief is based on information gathered from catalyst vendors and sanitation districts indicating that the presence of siloxanes in landfill or digester gas will lead to immediate catalyst fouling. One Sanitation District in California indicated that fouling of the catalyst starts immediately and rapidly gets worse. In their experience, catalyst fouling was noticed after about two weeks of operation, and the catalyst became practically ineffective after three months of operation. All of the catalyst vendors contacted by EPA indicated that there would be problems with catalyst deactivation with the use of landfill or digester gas.

I.C.2.4 Comment: Two commenters (421, 435) requested that the subcategory for CTs firing landfill or digester gas be expanded to included CTs used at gasification plants.

Response: The EPA agrees that if municipal solid waste (MSW) is used as fuel in a turbine, problems with catalyst fouling similar to those found for digester and landfill gas units may occur. Therefore, in the final rule, the subcategory for CTs firing landfill or digester gas has been expanded to include units where gasified MSW is used to generate 10 percent or more of the gross heat input to the stationary combustion turbine on an annual basis.

I.C.2.5 Comment: One commenter (427) stated that the subcategory for CTs firing landfill or digester gas should be expanded to other non natural gas fuels that would result in technical issues with catalyst operation similar to the issues for units firing landfill or digester gas. Examples of other fuels include biogas, refinery gas, and other low, medium, and high BTU gases.

Response: The commenter has not provided any data to support their comment that there would be technical issues with catalyst operation. Therefore, EPA does not have any evidence to suggest that turbines firing other non natural gas fuels would not be able to meet the emission limitations, and is not expanding the subcategory to other non natural gas fuels (other than fuels containing MSW).

3. Other

I.C.3.1 Comment: Six commenters (420, 425, 426, 430, 431, 502) expressed support for the subcategory for emergency stationary CTs.

Response: The EPA acknowledges the commenters' support. This subcategory has been retained in the final rule.

I.C.3.2 Comment: Six commenters (414, 422, 437, 485, 501, 541(F)) urged EPA to add a subcategory to cover turbines installed north of the Arctic Circle and to specify no additional control requirements for the subcategory. The commenters stated that technologies identified for controlling HAP emissions from stationary combustion turbines are unproven or have met with limited success in northern Alaska above the Arctic Circle. Lean premix combustion (LPC) turbines have met with limited success on the Alaska's North Slope. The annual average temperature above the Arctic Circle is approximately 10°F, with winter temperatures that can drop below -50°F. Turbine manufacturers have been required to "de-tune" the lean premix systems to ensure the integrity of the equipment at these cold ambient temperatures.

The commenters stated that one of the technical issues with LPC at the North Slope is the very wide range of ambient temperatures that the turbine must operate over. A range of -50°F to 80°F (130°F range) is a very challenging requirement for turbine manufacturers. They have to employ various air bleed, inlet guide vane control, or fuel staging to allow them to operate at the cold extremes. Sites in Canada have reported having to tune their Dry Low Emissions engines

differently for the summer and winter months. Even when temperatures drop to extremely low levels in the lower 48 states, the duration of those low temperatures is normally measured in hours; on the North Slope it is not uncommon for equipment to have to endure months of severe cold. In addition to this large range, at the colder end of the range the airflow on some turbine models can be 40 percent higher that at the standard ISO design conditions of 60°F creating an especially acute problem in LPC units. For these reasons turbines manufactures with experience in the Arctic do no guarantee NO_x and CO levels at cold ambient temperatures (below 0°F). Therefore, lean premix systems that can achieve low NO_x emissions typical of lower 48 applications have not been demonstrated to be achievable north of the Arctic Circle. On the North Slope, <0°F represents about one half of the year. Some of the turbine models with LPC do not even operate in a LPC mode at cold ambient temperatures because of their inability to maintain a stable flame at these conditions.

The commenters noted that lean premix systems require that combustion occur at the very lean edge of combustion. On the North Slope, unique environmental conditions make the application of lean premix particularly challenging. Such flames are inherently unstable and the manufacturer, to successfully employ this technology, must include extremely tight control on the excess air. The design operating point for LPC is closer to the lean extinction limit of the flame and, therefore, this type of combustor has an inherently limited range of operation. To address this limitation, manufacturers utilize either some type of variable air of fuel control or some type of air bleed arrangement. This complexity greatly adds to the inherent instability of these systems. The very lean flame can lead to acoustic disturbances in the combustor at certain operating conditions such as low loads and low ambient temperature. These acoustic patterns have led to mechanical failure of components and in the extreme have led to flameout. All of the North Slope operators have experienced this phenomenon, and thus far there has not been an universal solution. All nine of the LPC oil and gas production turbines on the North Slope have had some form of mechanical problems associated with the combustion system due to combustion acoustics or bleed system dynamics.

According to the commenters, vendors of CO oxidation catalysts have indicated that their products will perform adequately on the North Slope, but the technology has never been tried. To date, no CO oxidation catalyst has ever been installed on a turbine on the North Slope. It is unknown what impacts the extreme thermal conditions of North Slope operation will have on CO oxidation catalysts. There is no data on the effect the wider temperature range and rapid cool down might have on the ceramic or metal support for the catalyst. Gas turbines that must operate at low ambient conditions and at varying loads operate closer to their weak extinction limit than do base loaded turbines in the Lower 48. As a result the North Slope turbines could experience flameout conditions more frequently than Lower 48 turbines, particularly if the LPC design is utilized. The commenters are concerned that flameouts may result in damage to an oxidation catalyst due to the sudden introduction or a large amount of natural gas to the catalyst at high temperature.

In addition to emissions, the commenters stated that the requirement for a CO oxidation catalyst may have other adverse environmental impacts unique to the North Slope. To reduce

environmental impacts, the North Slope Operators have strived to reduce the facility "footprint." The "footprint" is the required amount of surface area required for the equipment site. This has a whole host of benefits in reducing impacts on tundra and wildlife. The commenters estimate that the addition of a catalyst system on the exhaust of gas turbines could double the footprint for the turbine itself.

Response: The EPA agrees with the commenters that a subcategory should be created for turbines installed north of the Arctic Circle to recognize their distinct differences. There is a substantial difference in temperature between the North Slope of Alaska and even the coldest areas in the lower 48 states. As noted by the commenters, turbine operators on the North Slope of Alaska have experienced problems with operation of the turbines in lean premix mode, and turbine manufacturers do not guarantee the performance of their turbines at the ambient temperatures typically found north of the Arctic Circle. In addition, no turbines on the North Slope are equipped with oxidation catalyst control. Therefore, a subcategory for turbines north of the Arctic Circle has been established. A MACT floor and MACT analysis has determined that MACT is no emission reduction requirement for these units.

I.C.3.3 Comment: One commenter (435) requested that EPA exempt transportable CTs from the rule or create a new subcategory for those units.

Response: Transportable CTs are considered stationary and therefore are not exempt from the rule. The EPA has evaluated the information provided by the commenter and does not believe a subcategory is necessary.

I.C.3.4 Comment: One commenter (516) said that EPA should add an exemption for stationary CTs that are specifically used to destroy or otherwise control volatile organic compound (VOC) emissions. The commenter felt that without such an exemption, the proposed NESHAP will create disincentives for further use and development of this method of controlling VOC emissions.

Response: The EPA does not agree that such an exemption is warranted. The commenter did not provide any information about turbines used to destroy or control VOC emissions. The EPA does not agree that the proposed NESHAP will create disincentives for this method of controlling VOC emissions.

I.C.3.5 Comment: Two commenters (513, 516) recommended that to be consistent with most other NESHAPs, EPA should add an exemption for research and development (R&D) to the applicability section of the proposed rule. Commenter 516 also requested that a definition of R&D be added to the proposed rule.

Response: The final rule provides that stationary CTs located at a research or laboratory facility are not subject to the NESHAP, if research is conducted on the turbine itself and the turbine is not being used to power other applications at the research or laboratory facility. A definition of research or laboratory facility is included in the final rule.

I.C.3.6 Comment: One commenter (487) contended that EPA should provide an exclusion for natural gas fired combined heat and power CTs to promote the generation of highly efficient, low emitting energy solutions at host facilities. The commenter had the opinion that the proposed rule economically disadvantages these types of projects.

Response: The commenter did not provide any details about how these facilities will be economically disadvantaged. Without such information, EPA is unable to address the concern directly. As a result, EPA is not changing the NESHAP in response to this comment.

I.C.3.7 Comment: One commenter (438) stated that turbines associated with military tactical support equipment are not addressed. The commenter believed that such turbines often have unique requirements for deployability that may preclude the use of add-on air pollution equipment, and the feasibility of applying controls to these turbines and the associated costs and cost effectiveness and environmental benefits should be evaluated and an exception or separate category for these turbines should be established if warranted.

Response: The EPA contacted the commenter to obtain more information about turbines associated with military tactical support equipment. The commenter indicated that they did not have any existing or planned military tactical support equipment with turbines greater than 1 MW. Therefore, no exemption or separate category is needed for these turbines.

I.C.3.8 Comment: One commenter (416) requested that § 63.6090(b)(4) be removed because stationary combustion engine test cells/stands are excluded from this source category.

Response: Section 63.6090(b)(4) has not been removed from the final rule. The section is necessary because it clarifies that CT engine test cells/stands do not have to meet the requirements of this subpart.

I.C.3.9 Comment: One commenter (416) asked that EPA clarify § 63.6090(b) to identify which excepted sources are not required to comply with the initial notification requirements of § 63.6145(d).

Response: Section 63.6090(b) has been clarified to clearly indicate which excepted sources are not required to comply with the initial notification requirements of § 63.6145(d).

I.C.3.10 Comment: Two commenters (442, 449) urged EPA to clarify that no initial notification is required for existing diffusion flame combustor (DFC) units, even if they are used in emergency service.

Response: The rule has been revised to clarify that no initial notification is required for any existing units, even if they are used in emergency service.

I.C.3.11 Comment: Three commenters (430, 443, 482) expressed support for EPA's subcategorization approach in the proposed NESHAP.

Response: The EPA acknowledges the commenters' support.

I.C.3.12 Comment: Two commenters (428, 502) expressed support for the exemptions for duct burners and stationary combustion engine test cells/stands.

Response: The EPA acknowledges the commenters' support. These exemptions have been retained in the final rule.

I.C.3.13 Comment: One commenter (502) expressed support for EPA's proposal to only require notification for emergency power units, limited use units, and units that combust digester gas or landfill gas.

Response: The commenter's support is acknowledged. This approach has been retained in the final rule.

D. Delisting

I.D.1 Comment: Commenter 460 submitted a revised petition to delist two subcategories of stationary combustion turbines: lean premix stationary combustion turbines firing natural gas as a primary fuel, and other turbines demonstrated to qualify for a low risk subcategory. An earlier version of the delisting petition was provided to EPA in August 2002; the revised petition was submitted to respond to EPA's request for additional information and to focus on the specific subcategories to be delisted. The commenter claimed the petition demonstrates that the stationary and lean pre-mix combustion turbines which fire natural gas as a primary fuel meet the statutory criteria for delisting because they do not pose a cancer risk greater than one in one million and noncarcinogens have a hazard index well below 1.0. The petition also indicates there will be no adverse environmental effects from this group of sources. The commenter's analysis showed that the vast majority of stationary combustion turbine installations would meet the delisting criteria, but due to the multiple turbine configurations and varying amounts of oil used as backup fuel, it was not possible to address all sources in the category. Therefore, the commenter suggested that each individual source that is not a lean premix turbine firing primarily natural gas be required to demonstrate that it qualifies for the low-risk subcategory. The commenter requested that EPA create a subcategory of stationary lean premix combustion turbines which fire natural gas as a primary fuel, create a low risk subcategory of stationary combustion turbines, and delist both of these subcategories at the same time that it issues any final MACT standard.

Twenty-one commenters (414, 421, 422, 424, 427, 431, 435, 437, 440, 443, 460, 464, 479, 482, 484, 485, 488, 501, 502, 508, 509) expressed support for the delisting petition.

Commenter 421 stated that based on a study conducted by the GTA, there is no health risk related to formaldehyde emissions from gas turbines at any level of aldehydes reported in the ICCR database. The GTA provided EPA with an analysis as part of its delisting petition that showed that formaldehyde levels from gas turbines would have to reach several hundred ppb to

even approach a one-in-a-million risk level to an individual exposed over 70 years. The commenter supported GTA's delisting petition since there is no risk to the most exposed individual, and stated that an emission standard at the levels proposed in the CT MACT offers no benefit.

Commenter 422 believes that the health risk evaluations necessary for EPA to delist combustion turbines as a source category will result in a finding of insignificant public health impact. The commenter believes that, consistent with the GTA delisting petition, EPA should delist gas-fired turbines as well as gas-fired with oil backup turbines.

Commenter 435 stated that the GTA petition demonstrates that natural gas-fired CTs (with limited oil backup) do not present a risk to human health or the environment above statutory delisting thresholds established in section 112(c)(9) of the CAA.

Commenter 440 believes that, as petitioned by the GTA, EPA may properly delist natural gas-fueled CTs from the source category list pursuant to section 112(c) of the CAA. The GTA included in its petition a study indicating that HAP emissions from gas-fueled turbines will not result in a lifetime cancer risk greater than one in one million to the individual in the population most exposed to emissions, thus satisfying the criteria for delisting. The commenter also noted that GTA will submit to EPA an addition to its petition that addresses deficiencies cited by EPA. The commenter added that they have modeled emissions from two of their facilities that demonstrate the highest predicted offsite receptor concentration of exposure to formaldehyde. The results showed concentrations of 0.507 $\mu g/m^3$ and 0.86 $\mu g/m^3$, values which are far lower than those required to protect human health and the environment.

Commenter 443 supported GTA's petition to delist gas turbines. The commenter cited the GTA study that showed that HAP emissions from gas-fueled turbines will not result in a lifetime cancer risk greater than one in one million to the individual in the population most exposed to emissions. In addition to the technical reasons for delisting, the commenter cited the following policy-related reasons for delisting: (1) gas turbines are clean and efficient, and delisting them will create an incentive for their use; (2) delisting gas turbines will create energy and economic benefits (resulting from creating the incentive for this efficient technology and the cost savings associated with delisting); and (3) delisting has administrative benefits for EPA by reducing the number of listed source categories for which EPA must promulgate final MACT standards.

Based on the emissions data evaluated by EPA in the combustion turbine rulemaking (Combustion Turbine Emissions Database v.5), Commenter 437 stated that gas-fired combustion turbines do not pose a significant health risk and should be delisted as allowed under 112(c)(9)(b). The commenter stated that natural gas and process gas fuels should be considered equivalent, and referenced EPA's statement in the preamble, "The summation of emission factors for various HAP when using natural gas...diesel fuel, or digester gas were comparable..." The commenter submitted data to demonstrate that tests on external combustion sources show no difference in HAP emissions among gaseous fuels. Therefore the commenter requested that EPA

consider the petition by the GTA to delist at least the gas-fired (including natural gas and process gas fuels) combustion turbine source category from section 112(c).

Commenter 431 believes it is within EPA's authority (under 112(c)(9)(b)) to provide a delisting such as that advocated by the GTA petition. The commenter urged EPA to fully consider this approach with recognition of the very low emitting nature of combustion turbine sources.

Commenters 501 and 485 believe EPA should delist the stationary combustion turbine source category as provided by section 112(c)(9) of the CAA. The commenters urged EPA to consider undertaking steps to fully evaluate exposure and public health impacts from stationary source combustion turbines, as the commenters believe these sources do not pose a significant health risk. The commenters believe that the proposed regulation will not result in significant environmental benefits. The commenters noted that the majority of combustion turbines currently in operation will not be regulated since the MACT floor for diffusion flame turbines is no emission reduction, and above-the-floor options were deemed cost prohibitive. In addition, the commenters noted that EPA expects the majority of new combustion turbines installed to be LPM units, which will have reduced CO and HAP emissions. Therefore the net benefit of reduced HAP emissions from combustion turbines will ultimately be realized without regulation under Part 63, and the source category should be delisted.

Commenter 464 urged EPA to give serious consideration to the petitions to delist. The commenter believes the data EPA gathered for the rulemaking demonstrates that stationary combustion turbines are relatively small sources of HAP emissions.

Commenter 474 believes EPA should reconsider the need for a MACT standard for combustion turbines based on significant additional information that has become available on health and environmental risks related to this source category. The commenter cited the GTA petition to delist gas turbines from the MACT source category list and the November 20, 2002 Air Daily publication which reports that formaldehyde emissions pose such a minimal risk that they do not warrant rulemaking.

Commenter 488 strongly supported the efforts of the GTA to delist lean pre-mix combustion turbines and natural gas fired turbines from the rule under section 112(c)(9). In addition, the commenter supported an expansion of the delisting category to include other gaseous fuel forms with similar properties to natural gas such as refinery fuel gas. The commenter noted that petroleum refineries are inherently major sources of HAP emissions that potentially could have to install expensive controls on insignificant sources of HAP emissions like turbines simply because they are located at a major facility. The commenter considered this potentially inequitable as significantly larger turbines with higher HAP emissions could be exempt simply because they are not located at a major facility.

Response: The EPA acknowledges the support expressed by the commenters but notes that the delisting petition is on a separate schedule and not associated with this rule.

I.D.2 Comment: One commenter (488) recommended that the delisting category include other gaseous fuel forms with similar properties to natural gas, such as refinery fuel gas.

Response: The delisting petition submitted by the Gas Turbine Association did not request that turbines firing other gaseous fuel forms be delisted. The EPA will only consider delisting the sources indicated in the delisting petition.

I.D.3 Comment: One commenter (460) recommended that EPA seek a modification of the consent decree agreement with the Sierra Club to allow sufficient time to act on the delisting petition.

Response: The EPA would only seek a modification of the consent decree deadline in circumstances where EPA has concluded that the MACT standard itself could not be promulgated in the agreed time frame.

E. Other

I.E.1 Comment: Two commenters (485, 501) expressed the view that the routine exchange of aeroderivative turbines for routine overhaul should not result in a facility becoming a new source. Commenter 439 stated that EPA should provide (a) an exemption for temporary replacement engines during routine rebuilds and (b) a mechanism to reduce the likelihood a source would suddenly trigger new source preconstruction review/approval and MACT requirements arising from an unexpected repair or replacement of a stationary CT. One way to accomplish (b) is to provide a definition of "reconstruction" exclusively for Subpart YYYY. EPA could define the term "comparable new source" to include the affected unit and "all physically and functionally integrated ancillary equipment."

One commenter (421) suggested that the definition of "reconstructed turbine" be clarified and at a minimum exclude any gas turbine that undergoes a repair or maintenance operation. One commenter (422) recommended that the following language be added to § 63.6090(b):

> (5) Removal and replacement of an entire turbine or turbine subsection (e.g., gas producer section, power turbine section), with a functionally equivalent turbine or subsection, which does not result in an increase in HAP emissions, shall not be considered construction of a new affected source or reconstruction of an existing affected source.

Response: The definition of reconstructed turbine in the proposed rule is consistent with the General Provisions of Part 63. If an existing CT is refurbished to the extent that it meets the definition of reconstruction, then it should be considered a reconstructed source. The EPA is not aware of any routine refurbishment for which the fixed capital cost of the new components exceeds 50 percent of the fixed capital cost that would be required to construct a comparable new source.

I.E.2 Comment: Seven commenters (422, 431, 437, 440, 484, 502, 519) said that the definition of affected source should be modified to be consistent with the definition found in § 63.2 of the General Provisions.

Response: Although 40 CFR 63.2 of the General Provisions provides that EPA will generally adopt a broad definition of affected source, which includes all emission units within each subcategory which are located within the same contiguous area, this section also provides that EPA may adopt a narrower definition of affected source in instances where EPA determines that the broader definition would "create significant administrative, practical, or implementation problems" and "the different definition would resolve those problems." This is such an instance. Because of the way that the subcategories of combustion turbines are defined, individual turbines can switch between subcategories based on the fuel they are burning. The EPA has taken some steps in the definition of subcategories to limit the frequency of such switching between subcategories, because EPA believes it could create confusion and complicate compliance determinations. However, fuel specific subcategories are necessary to derive a MACT floor which appropriately considers the difference in the composition of the HAPs emitted based on the fuel used. Thus, EPA cannot eliminate the possibility that individual turbines will switch subcategories. Use of the broader definition of affected source specified by the General Provisions would require very complex aggregate compliance determinations, because an individual turbine could be part of one affected source at one time and part of a different affected source at another time. This would require that the contribution of each turbine to total emissions for all emission units within each subcategory be adjusted to reflect the proportionate time the unit was operating within that subcategory. The EPA believes such complicated compliance determinations to be impractical, and therefore has decided to adopt a definition which establishes each individual combustion turbine as the affected source.

I.E.3 Comment: Two commenters (427, 487) remarked that a CT that is co-located at a major source (but would not be a major source by itself) would be put at an economic disadvantage merely because of location, without regard to CT emissions.

Response: The CAA requires EPA to regulate all major sources of HAP. The definition of major source includes all HAP-emitting units which are located within a contiguous area and under common control. Thus, the claimed discriminatory impact on combustion turbines which are co-located with other sources that emit HAP is intrinsic to the statutory scheme.

I.E.4 Comment: One commenter (437) felt that EPA should add a new § 63.6095(b)(2) (with the existing § 63.6095(b) becoming (b)(1)) stating that existing CTs at area sources that become major sources are not affected.

Response: Combustion turbines which are located at area sources that subsequently become major sources would be subject to the rule. However, such turbines would be existing sources, and EPA has not adopted emission control requirements for existing sources.

I.E.5 Comment: Two commenters (442, 449) requested that the final rule include the

non-aggregation provisions for transmission and storage facilities from the Natural Gas Transmission and Storage MACT.

Response: The EPA has incorporated this comment in the final rule. The non-aggregation provisions for transmission and storage facilities from the Natural Gas Transmission and Storage MACT (40 CFR part 63 subpart HHH), which are found in the definition of major source in that subpart, are as follows:

(1) Emissions from any pipeline compressor station or pump station shall not be aggregated with emissions from other similar units, whether or not such units are in a contiguous area or under common control; and
(2) Emissions from processes, operations, and equipment that are not part of the same natural gas transmission and storage facility, as defined in this section, shall not be aggregated.

The non-aggregation provisions in (1) above were already included in the proposed definition of major source for the CT NESHAP and have been retained in the final rule. The non-aggregation provisions in (2) above have also been added to the definition of major source for the CT NESHAP.

I.E.6 Comment: One commenter (518) stated that the proposed emission limits should be applied to all CTs (both new and existing, at major and non-major facilities), not just to CTs at major HAP facilities.

Response: This rule will not cover area sources. In developing the Urban Air Toxics Strategy, EPA identified area sources that EPA believes warrant regulation to protect the environment and the public health and satisfy the statutory requirements in section 112 of the CAA pertaining to area sources. Stationary CTs located at area sources were not included on that list. As a result, the final rule does not apply to stationary CTs located at area sources.

I.E.7 Comment: Five commenters (418, 427, 442, 449, 520) urged EPA to establish at least two size subcategories of LPC CTs to account for the differences between large and small LPC units. Two of those commenters (427, 429) recommended that at least one subcategory be created to represent stationary CTs less than 25 MW in size.

Response: The commenters noted that large utility (heavy duty) LPC units have inherent technical characteristics that make them different from small industrial and aeroderivative LPC turbines, including multiple-combustion chamber assemblies, higher firing temperatures, advanced airflow and cooling techniques, dimensional scaling benefits, and advanced combustion systems and controls. The combustors for small CTs are smaller, therefore there is not enough room do to the same amount of mixing as for larger units. Due to these technical distinctions, emission profiles for large LPC units have historically been different from those of small industrial and aeroderivative turbines. Manufacturers of large LPC units offer NOx and CO guarantees below 25 ppm and as low as 9 ppm. Manufacturer guarantees for small industrial and aeroderivative turbines are on the order of 25 to 42 ppm for NOx and 50 ppm for CO.

The EPA agrees with the commenters that emission profiles are different for large and small units. Due to the limited amount of emissions data EPA had at proposal, EPA requested HAP emissions test data from stationary combustion turbines in the proposed rule. As a result of this request, EPA received new data in the form of several test reports during the comment period. The data set demonstrates that on average, when comparing formaldehyde emissions from turbines of the same combustor and fuel type, the uncontrolled emissions are higher for smaller units. The analysis of the MACT floor showed that both large and small units are equipped with add-on HAP emission control. However, EPA has a limited data set that does not include testing of either a large diffusion flame or small lean premix turbine with add-on HAP emission control. Consequently, EPA would have to set the same limit for small and large units. Therefore, EPA did not see any reason to subcategorize by size and has not done so.

II. DEFINITIONS

A. Lean Premix Stationary Combustion Turbine

II.A.1 Comment: One commenter (478) requested that the definition of lean premix stationary combustion turbine be modified to recognize that fuel and air mixing may be occurring in the combustor of some LPC CTs. The definition should be modified to include these types of stationary CTs that burn a lean mixture and thoroughly mix their fuel prior to combustion in the combustor.

One commenter (430) asked for clarification of the definition of lean premix stationary combustion turbine as it applies to CTs that meet the definition while burning one fuel, but fail to meet the definition while burning another fuel.

Response: The EPA has revised the definition of lean premix technology to recognize that fuel and air mixing may be occurring in the combustor of some LPC CTs. In the final rule, lean premix gas-fired units that fire oil will still remain in the lean premix gas-fired units subcategory if the turbine is located at a major source where all new and existing stationary combustion turbines fire oil no more than an aggregate total of 1000 hours during the calendar year. This allowance will limit the frequency of switching between subcategories, and it is believed the 1000 hour allowance will be sufficient to accommodate those situations where distillate oil is used as a backup.

B. Emergency Stationary Combustion Turbine

II.B.1 Comment: Nine commenters (414, 422, 425, 426, 438, 485, 501, 502, 519) said the definition of emergency stationary combustion turbine should include operational allowances for the periodic operation/testing to verify operational readiness. Commenter 438 stated that it is not clear if testing and maintenance operations are included in the limit of 50 hours for non-emergency operations; the definition should be clarified in this respect, and the number of hours allowed for nonemergency operations should also reflect the testing and maintenance needs for

emergency CTs for certain types of operations (example - airport operations). Commenter 519 recommended that the following should be added to the definition: "Required testing of such units should be minimized, but there is no time limit on the use of emergency stationary sources."

Three commenters (420, 442, 449) felt that EPA should raise the threshold to 100 hours of non-emergency operation in order to provide sufficient time for maintenance, training, and reliability testing/early-on operation.

Response: The EPA agrees with the commenters that routine testing and maintenance to ensure operational readiness should be included in the definition of emergency turbine and has made this revision in the final rule. The routine testing and maintenance must be within limits recommended by the turbine manufacturer or other entity such as an insurance company.

II.B.2 Comment: One commenter (438) requested that the definition be clarified, or extended, to allow for operations in anticipation of an emergency situation.

Response: The EPA does not agree that operation in anticipation of an emergency situation should be included in the definition of emergency turbine and has not made this change.

II.B.3 Comment: Four commenters (422, 438, 502, 519) asked for clarification as to whether loss power that constitutes an emergency is limited to power supplied to the facility as a whole or includes power supplied to portions of a facility.

Response: The definition of emergency turbine has been revised to indicate that loss of power that constitutes an emergency can include power supplied to portions of a facility.

II.B.4 Comment: Three commenters (422, 431, 502) recommended that operation not be limited to only those times when the primary power source has been interrupted. They commented that operation should not be restricted at all, providing the primary design purpose of the unit is to provide emergency services, fire water, etc.

Response: The EPA intended that the definition of emergency turbine include operation during emergency situations, including times when the primary power source has been interrupted as well as other situations such as pumping water in the case of fire or flood, which was given as an example of emergency operation in the definition in the proposed rule. The definition has been clarified to clearly indicate that operation is not limited to only times when the primary power source has been interrupted.

II.B.5 Comment: Three commenters (416, 485, 501) recommended that the definitions of emergency CT and limited use CT be combined into a single definition.

Response: The EPA has not included a separate subcategory for limited use CTs in the final rule. Thus, the comment is moot.

II.B.6 Comment: One commenter (502) suggested that EPA should include more examples of emergency operation in the definition. These might include fuel and raw material curtailments that require the operation of a standby stationary CT.

Response: The EPA contacted the commenter for more information about what types of curtailments they were concerned with. The commenter provided only one example, which was shutdown of offshore wells during a hurricane. The EPA believes that the definition of emergency stationary combustion turbine is sufficient to cover this particular scenario and it is not necessary to include more examples of emergency operation. It would be nearly impossible to provide examples of every potential type of emergency situation.

II.B.7 Comment: One commenter (437) advised that the 50 hours per year definition should be changed to mean a CT whose operation is restricted by federally enforceable limits to less than 876 hours per year. Their rationale is that 876 hours is enough time over a period of one year to cover a wide range of potential needs for the CT, including emergency power, stand-by compression, peaking, testing and maintenance, and compensation for "brownouts" or power interruptions. The commenter noted that some units in critical emergency service such as backup power may required testing on a frequent basis to ensure reliability.

Response: The operation of emergency turbines for emergency use is not limited to a specific number of hours, and routine testing and maintenance to ensure operational readiness have been included in the definition of emergency turbine. This is discussed in greater detail in the response to comment II.B.1. As discussed in the response to comment II.C.1.1, the final rule does not include an subcategory for limited use units, therefore the suggestion to increase the operating limit to 876 hours per year is moot.

II.B.8 Comment: One commenter (412) said that the use of emergency equipment is being severely limited because it appears in the preamble that emergency stationary CTs have been made a subset of the limited use category.

Response: Emergency stationary CTs are not a subset of the limited use category. The final rule does not have a category for limited use units. Thus, the use of emergency equipment is not being severely limited.

C. Stationary Combustion Turbine

II.C.1 Comment: Two commenters (485, 501) proposed that the definition of "stationary combustion turbine" include all appropriate associated equipment. Two commenters (422, 502) recommended that stationary combustion turbine should be defined as follows:

> "A stationary combustion turbine includes all equipment, including but not limited to the turbine, the fuel, air, lubrication and exhaust gas systems, control systems, and any ancillary components and sub-components comprising any simple cycle stationary combustion turbine, any regenerative/recuperative cycle stationary combustion turbine,

the combustion turbine portion of any stationary cogeneration cycle combustion system, or the combustion turbine portion of any stationary combined cycle steam/electric generating system. Stationary means that the combustion turbine is not self propelled or intended to be propelled while performing its function."

Response: The EPA has adopted the commenters suggested modification to the definition of stationary combustion turbine but has clarified the definition to indicate that emissions control equipment are not considered part of the stationary combustion turbine.

II.C.2 Comment: One commenter (435) expressed the opinion that EPA should employ consistent definitions of "mobile" and "stationary" from MACT standard to MACT standard. One commenter (422) remarked that the definition should be modified to exclude portable/transportable turbines.

Response: The EPA does not agree that it is necessary to employ consistent definitions of "mobile" and "stationary" from MACT standard to MACT standard. The commenter cited the definition of "stationary" in the proposed MACT standard for stationary reciprocating internal combustion engines (RICE). The definition from this rule cannot be compared to the RICE rule; the RICE rule does not cover stationary RICE that are portable or transportable because those engines are already covered by the rule for mobile RICE sources.

II.C.3 Comment: One commenter (438) requested that the definition of stationary combustion turbine be moved to the definitions section instead of being defined in § 63.6085(a).

Response: The EPA agrees that stationary combustion turbine should also be defined in the definitions section. This change has been made in the final rule.

D. Major Source

II.D.1 Comment: One commenter (437) expressed support for the definition of major source, except as follows:

The phrase "except when they are on the same surface site" should be removed from the end of part (1) of the Combustion Turbine major source definition. This phrase is not present in the 40 CFR Part 63 Subpart HH major source definition that is the template for the Combustion Turbine MACT major source definition. Section 112(n)(4) of the CAA of 1990 requires that wells and associated equipment not be aggregated even within the same surface site except as provided in part (3) of the Combustion Turbine MACT major source definition.

In part (3) of the Combustion Turbine MACT major source definition, the phrase "storage vessel with flash emissions potential" should be changed to "storage vessel with the potential for flash emissions" to conform to the 40 CFR Part 63 Subpart HH definition.

The General Provision major source definition presented in the Combustion Turbine

MACT is different from those found in the definition of major source in the National Emission Standards for Hazardous Air Pollutants From Oil and Natural Gas Production Facilities (40 CFR 63.761). The significance of this difference is that sources that are area sources under Subpart HH could possibly be rendered "Major Sources" under Combustion Turbine MACT. EPA should acknowledge this possibility in the preamble to the final rule and clearly state that this does not change the source's status under Subpart HH or any other MACT. Similarly, one commenter (422) recommended that the preamble clarify that the definition of major source in the CT MACT does not alter the definition of major source in Subpart HH, and therefore does not affect Subpart HH applicability.

Response: The EPA agrees that the phrase "except when they are on the same surface site" should be removed from the end of part (1) of the Combustion Turbine major source definition and the phrase "storage tanks with flash emissions potential" in part (3) of the Combustion Turbine MACT major source definition should be changed to "storage vessel with the potential for flash emissions;" these changes have been made in the final rule.

The EPA recognizes the commenters' concern regarding the definition of major source in the CT NESHAP and its difference from the definition of major source in Subpart HH. The preamble to the final rule clarifies that the definition of major source in the CT MACT does not alter the definition of major source in Subpart HH, and therefore does not affect Subpart HH applicability.

E. Other

II.E.1 Comment: Two commenters (428, 502) suggested that the definition of diffusion flame stationary combustion turbine should be modified to recognize that swirl cups, nozzles or orifice mixers are used to provide fuel and air mixing in some diffusion flame combustors. The definition should be modified to read "diffusion flame stationary combustion turbine means any stationary combustion turbine where fuel and air are injected at the combustor and are mixed by diffusion, swirl cups, nozzles or orifices prior to ignition."

Response: The EPA believes that the definition of diffusion flame stationary combustion turbine is adequate. Diffusion is the means by which the gas is mixed. The identified devices are parts of the combustor used to mix the gas and do not affect how the combustor is classified.

II.E.2 Comment: One commenter (438) observed that in the proposed rule landfill and digester gas are defined as being formed through anaerobic decomposition, which is usually but not always the case.

Response: The definitions of landfill gas and digester gas were modified to indicate that they are typically formed through anaerobic decomposition.

II.E.3 Comment: One commenter (502) stated that the definition of "deviation" should be changed to "excursion" to avoid confusion with Title V operating permit requirements and for

consistency with other MACTs (e.g. HON).

Response: The EPA does not agree with the commenter that the definition of deviation should be changed to excursion. The term "deviation" has been commonly been used in other MACT standards.

II.E.4 Comment: One commenter (437) recommended that the definitions from 40 CFR Subpart HH and HHH for glycol dehydration unit, storage vessel with the potential for flash emissions, and production well should be included.

Response: The EPA agrees with the commenter that the definitions should be included in the CT NESHAP. The definitions from 40 CFR Subpart HH and HHH for glycol dehydration unit, storage vessel with the potential for flash emissions, and production well have been added to the final CT NESHAP.

II.E.5 Comment: Three commenters (437, 442, 449) requested that EPA acknowledge that the special potential to emit (PTE) provisions in 40 CFR Part 63 Subpart HH are also applicable to the CT PTE determination by referencing these provisions in the CT PTE definition. Commenters 449 and 442 recommended that the following provisions from the Natural Gas Transmission and Storage MACT should be incorporated in the CT rule:

1) 40 CFR 63.1270(a)(1) - maximum annual facility natural gas throughput for storage facilities
2) 40 CFR 63.1270(a)(2) - maximum annual throughput for transmission facilities

Response: The EPA has incorporated these comments in the final rule by modifying the definition of PTE in the final rule to include the following:

"For oil and natural gas production facilities subject to subpart HH of this part, the potential to emit provisions in § 63.760(a) may be used. For natural gas transmission and storage facilities subject to subpart HHH of this part, the maximum annual facility gas throughput for storage facilities may be determined according to § 63.1270(a)(1) and the maximum annual throughput for transmission facilities may be may be determined according to § 63.1270(a)(2)."

II.E.6 Comment: One commenter (449) recommended that the following definitions from the T&S MACT (40 CFR 63.1271) should be incorporated into the final rule to address the non-aggregation provisions for transmission and storage facilities: compressor station, custody transfer, facility, major source, natural gas transmission, surface site.

Response: The proposed CT NESHAP included definitions for custody transfer and surface site that were consistent with the definitions in the T&S MACT; the definitions have been retained in the final rule. The proposed rule also had a definition of major source, which has been modified in the final rule to include the language from the T&S MACT major source

definition. The definitions from the T&S MACT for compressor station, natural gas transmission and storage facility, and natural gas transmission have been added to the final CT rule.

III. DATES

III.1 Comment: Two commenters (412, 541(C)) indicated that the 45 day comment period was insufficient.

Response: The EPA believes the comment period was sufficient. The shorter comment period was necessary due to the August 30, 2003 promulgation period. Additionally, the rule was posted on the EPA website prior to publication in the Federal Register. A notice was published in the Federal Register on January 3, 2003 indicating that a copy of the rule was available on the EPA's website.

III.2 Comment: One commenter (386) contended that the August 30, 2003 promulgation date does not provide enough time for EPA to receive and fully consider public comments, resolve significant testing/monitoring issues, and consider risk-based alternatives and the delisting petition. The October 10, 2003 deadline for Part 2 112(j) permit applications is also not reasonable.

Response: The EPA does not agree with the commenter and believes that the August 30, 2003 promulgation date provides sufficient time for EPA to evaluate all necessary considerations prior to promulgation of the final rule.

III.3 Comment: Two commenters (412, 443) stated that immediate compliance is unrealistic for new or reconstructed turbines, and recommended a one year compliance timeframe.

Response: The EPA believes that immediate compliance is appropriate for new or reconstructed turbines and is consistent with the General Provisions of Part 63. Sources are required to install the proper equipment and meet the applicable emission limitations on startup; however, EPA allows sources 180 days to demonstrate compliance.

III.4 Comment: Three commenters (418, 442, 449) recommended that the final rule allow one year to conduct the initial performance test, rather than the 180 days provided by the Part 63 General Provisions.

Response: The EPA feels that 180 days is sufficient time to conduct the initial performance test, even for turbines that are used in load following operations. The 180 day time period is consistent with the General Provisions of Part 63. Sources have the option to petition for additional time on a case-by-case basis if necessary.

III.5 Comment: Three commenters (412, 478, 502) remarked that immediate compliance is unrealistic for area sources that become major sources. Commenter 412 recommended a one year compliance timeframe for those sources, while commenters 478 and 502 suggested that area sources that become major sources be given three years to comply, consistent with 40 CFR Part 63, Subpart A, in which EPA recognizes that existing area sources that become major sources need some time to come into compliance with the relevant MACT standards. See § 63.6(c)(5).

One commenter (443) proposed that sources that are unable to meet the formaldehyde standard or that are no longer in compliance with the limited use provision be granted at least 18 months to install catalysts. One commenter (449) requested that limited use units be allowed one year to implement MACT if utilization increases beyond the 10 percent utilization factor.

Response: The EPA does not agree with the comments that immediate compliance is unrealistic for area sources that become major sources. These sources are aware in advance of their change in status from area source to major source and therefore should have sufficient time to plan for immediate compliance with this rule. As mentioned in the response to comment III.3, a period of 180 days is allowed to demonstrate compliance. The proposed subcategory for limited use units has not been retained in the final rule, thus, that comment is moot.

III.6 Comment: One commenter (417) requested that § 63.6110 be revised to read "within 180 calendar days after the compliance date that is specified for your stationary combustion turbine in § 63.6095 and according to the provisions in § 63.7(a)(2), unless the testing is delayed pending the resolution of a petition to the Administrator under § 63.6120(f)." Another way to resolve this issue is word changes in § 63.6095(a)(2).

Response: The EPA does not feel that this change is necessary. If a source has petitioned the Administrator under § 63.6120(f), the petition could include a request to delay the testing.

III.7 Comment: One commenter (420) advised that EPA should ensure timely finalization of the proposed rule prior to the relevant Sierra Club settlement trigger date because submittal of Part 2 case-by-case MACT applications will be overly burdensome for both affected sources and state regulatory agencies.

Response: EPA intends to finalize this rule on schedule.

III.8 Comment: Two commenters (442, 449) requested that the rule provide one year for initial notification of MACT applicability, as in the T&S MACT and the Oil and Natural Gas Production MACT, instead of 120 days.

Response: The EPA does not agree that one year is necessary for initial notification of MACT applicability. An initial notification is not a time consuming activity.

IV. MACT

A. MACT Floor and MACT for Diffusion Flame Units

IV.A.1 Comment: Two commenters (428, 440) expressed support for EPA's determination of the MACT floor for DFC units. Commenter 428 remarked that EPA is justified in relying on the data it had; since fewer than 3 percent of sources have oxidation catalysts, the floor is no control. Commenter 440 said that the determination that MACT floor is no emission reduction is lawful because EPA determined that the best-performing source was not achieving emissions reduction through the use of an emission control system and there were no other methods by which CTs could reduce HAP emissions.

Response: The EPA acknowledges the commenters' support. This approach has been preserved in the final rule.

IV.A.2 Comment: Three commenters (485, 488, 501) took issue with the MACT floor for new DFC turbines. The commenters stated that no formaldehyde emissions data or oxidation catalyst control efficiency data were available to EPA to support setting the MACT floor for new DFC turbines; newer models of turbines in the DFC category should be evaluated to identify the best-performing unit.

Response: At proposal, EPA had limited emissions data for stationary combustion turbines, including one test for a DFC turbine with add-on HAP emission control. Due to the limited amount of emissions data EPA had at proposal, EPA requested HAP emissions test data from stationary combustion turbines in the proposed rule. As a result of this request, EPA received new emissions data for DFC turbines during the comment period, including an additional formaldehyde test on a DFC unit equipped with add-on HAP emissions control. The new data also includes several tests conducted using FTIR, which is regarded as the most accurate measurement method for formaldehyde for stationary CTs. Thus, the data set has been significantly improved, both quantitatively and qualitatively, and EPA believes that the data set is sufficient to identify the best-performing unit.

Based on comments and information received during the public comment period, the DFC subcategory was divided further into subcategories for DFC CTs when firing gas and when firing oil at sites where all turbines fire oil for no more than 1000 hours annually ("DFC gas-fired turbines") and for DFC CTs when firing oil at sites where all turbines fire oil more than 1000 hours annually ("diffusion flame oil-fired turbines"). The rationale for this subcategorization is discussed in the response to comment IV.A.8.

To determine the MACT Floor for new DFC gas-fired turbines, the best performing unit was identified from the new data set. The best performing unit in this subcategory is equipped with an oxidation catalyst. The outlet formaldehyde concentration of this turbine was 15 ppb. This number was measured using the method CARB 430 and a bias factor was applied to the reported results; this is discussed in greater detail in the response to comment V.A.1 and in

memoranda available in the rulemaking docket. Two tests on the best controlled LPC unit (also equipped with an oxidation catalyst) showed a variability of approximately a factor of five. It is expected that similar variability would be associated with DFC turbines as is associated with the LPC turbine. Therefore, applying a factor of five to the formaldehyde concentration measured at the outlet of the turbine is appropriate to account for the variability of the best performing unit. This results in a formaldehyde emission limit of 75 ppb, however, with a similar control system, the emission limit should be no lower than the emission limit for LPC units since DFC CTs on average emit more HAP. Therefore, it is appropriate to establish the MACT Floor for new DFC gas-fired units at the same level as the MACT Floor for new LPC gas-fired units, 91 ppb.

To determine the MACT Floor for new DFC oil-fired turbines, the best performing unit in this subcategory was identified from the new data sat. This turbine is equipped with an oxidation catalyst. The outlet formaldehyde concentration of this turbine was 44 ppb. This number was measured using EPA Method 0011 and a bias factor was applied to the reported results; this is discussed in greater detail in the response to comment V.A.1 and in memoranda available in the rulemaking docket. Only one test was available for this turbine, but some variability as has been shown for other turbines is expected. However, since formaldehyde emissions from distillate oil fired units are lower on average by a factor of 1.4, EPA does not believe that the MACT emission limit should be set higher than the emission limit for new stationary DFC gas-fired CTs. The MACT Floor for new DFC oil-fired CTs is therefore an emission limit of 91 ppb.

The EPA examined the inventory database to identify any operating practices which could affect metal emissions and was unable to identify any such practices. The EPA also determined that no existing DFC CTs firing distillate oil are equipped with emission control devices for the reduction of PM which could also reduce metal emissions. The EPA examined the inventory database in an attempt to identify any operating practices which could affect metal emissions, however, EPA was unable to identify any such practices.

IV.A.3 Comment: Twelve commenters (420, 422, 426, 430, 431, 437, 443, 446, 476, 479, 502, 519) expressed support for EPA's determination that MACT for existing DFC turbines should be set at the MACT floor, no controls/no emission reductions.

Response: The EPA acknowledges the commenters' support. This approach has been preserved in the final rule.

IV.A.4 Comment: Three commenters (431, 440, 476) stated that EPA is correct in determining that use of oxidation catalyst as a beyond the floor MACT is cost prohibitive for existing DFC units. Commenter 440 also said that EPA correctly concluded that fuel switching is not a viable beyond the floor option for MACT.

Response: The commenters' support is acknowledged.

IV.A.5 Comment: One commenter (472) contended that the MACT Floor for existing

DFC is unlawful because EPA did not identify the best performing sources or determined the emission levels they are achieving; EPA merely considered whether or not they are equipped with a catalyst. The commenter stated that whether or not the relevant best sources are equipped with control equipment, they are achieving some emission level, and EPA must determine the average emission level they are achieving and set floors at that level.

Response: The EPA agrees with the commenter that all factors which might control HAP emissions must be considered in making a floor determination for each subcategory, and that this analysis cannot be properly limited to add-on controls. However, EPA disagrees that it must express the floor as a quantitative emission level in those instances where the source on which the floor determination is based has not adopted or implemented any measure that would reduce emissions. In this instance, EPA decided to subcategorize within diffusion flame combustion turbines based on the fuel which is used, because the composition of HAP emissions differs materially based on whether gas or oil is used. The EPA then determined for each subcategory of diffusion flame combustion turbines that emissions of each HAP are relatively homogenous across that subcategory, and that there are not any adjustments of the turbines or other operational modifications except for the use of add-on controls which would be effective in reducing HAP emissions. Since the source on which the floor for existing sources in each subcategory of diffusion flame turbines is based has not installed such add-on controls, EPA determined that the MACT floor for each such subcategory requires no emission reductions. The EPA has also established fuel-based subcategories within lean premix combustion turbines, and has made a comparable determination that the MACT floor for existing sources within each of these subcategories requires no emission reductions.

IV.A.6 Comment: One commenter (472) said that the MACT Floor for new DFC is unlawful because EPA did not identify the best-performing DFC CT and the floor does not reflect what that source achieved in practice. According to the commenter, EPA ignored other factors that affect source's performance (fuel, design, age, maintenance, operator training, skill and care, differences in effectiveness of catalysts). The performance of all sources using an oxidation catalyst is not the same and cannot possibly reflect the performance of the single best source.

Response: The EPA agrees with the commenter that the standard for new sources within each subcategory must be based on the emission levels achieved in practice by the best controlled similar source. However, EPA thinks that the performance in reducing emissions by the best controlled source will not be uniform, and that it would be inappropriate to establish a standard which could not be consistently met even by the source upon which the standard is based. The EPA therefore believes that there must be some allowance made for the intrinsic variability in the effectiveness of controls in the standard EPA establishes. The EPA does not think that the performance of oxidation catalysts differs as much from one turbine to the next as suggested by the commenter, and EPA believes that the emission control levels achieved in practice by catalysts on differing turbines is one factor EPA may appropriately consider in evaluating the variability in emission control levels which is intrinsic to catalyst operation.

IV.A.7 Comment: One commenter (472) remarked that EPA did not say what the cost per ton would be for beyond the floor standards or why it is viewed as excessive. Therefore, EPA's rejection of beyond the floor standards is arbitrary and capricious.

Response: Information on the cost of oxidation catalyst control per ton of HAP removed is available from the docket for this rulemaking. This information is in a memorandum that can be obtained from the EPA's Edocket website. The Edocket Document ID for the memorandum is OAR-2002-0060-0044 (A-95-51 II-B-30).

IV.A.8 Comment: One commenter (472) observed that EPA stated that it considered fuel switching but could not find a less HAP emitting fuel. The EPA's own data show that CTs burning fuel oil have higher benzene and xylene emissions than CTs firing natural gas or landfill gas. Had EPA tested other HAPs, it would likely have found that fuel oil produces higher levels of those HAPs as well. The EPA has already found the entire diesel exhaust stream to be hazardous.

Response: The EPA agrees with the commenter that the composition of HAP emissions are different for CTs firing natural gas and CTs firing oil. The EPA has evaluated both the data it had prior to proposal and the data received since proposal; the test data supports the conclusion that HAP emissions are different for different fuels for stationary DFC units. Uncontrolled formaldehyde emissions are in general lower as a result of the combustion of distillate oil than for natural gas. Other differences in emissions between natural gas and distillate oil include higher levels of pollutants such as PAH and metals for stationary CTs burning distillate oil.

The EPA proposed one subcategory for combustion turbines using lean premix technology and another subcategory for combustion turbines using diffusion flame technology. However, in recognition of the clear differences EPA found in the composition of HAP emissions depending on the fuel that is used, EPA has determined that it is appropriate to subcategorize further based on fuel use. In devising appropriate subcategories based on fuel use, EPA needs to consider that many combustion turbines are configured both to use natural gas and distillate oil. These dual fuel units typically burn natural gas as their primary fuel, and only utilize distillate oil as a backup. To limit the frequency of switching between subcategories caused by limited usage of a backup fuel, EPA has defined the gas subcategories in a manner which permits combustion turbines that fire gas to remain in the gas subcategory if all turbines at the site in question fire oil no more than a total of 1000 hours during the calendar year. The following subcategories have therefore been established:

- Lean Premix Gas-Fired Turbines. This subcategory includes (a) each stationary combustion turbine which is equipped only to fire gas using lean premix technology, (b) each stationary combustion turbine which is equipped both to fire gas using lean premix technology and to fire oil, during any period when it is firing gas, and (c) each stationary combustion turbine which is equipped both to fire gas using lean premix technology and to fire oil, and is located at a major source where all stationary combustion turbines fire oil no more than an aggregate total of 1000 hours during the calendar year.

- Lean Premix Oil-Fired Turbines. This subcategory includes (a) each stationary combustion turbine which is equipped only to fire oil using lean premix technology, and (b) each stationary combustion turbine which is equipped both to fire oil using lean premix technology and to fire gas, and is located at a major source where all stationary combustion turbines fire oil more than an aggregate total of 1000 during the calendar year, during any period when it is firing oil.

- Diffusion Flame Gas-Fired Turbines. This subcategory includes (a) each stationary combustion turbine which is equipped only to fire gas using diffusion flame technology, (b) each stationary combustion turbine which is equipped both to fire gas using diffusion flame technology and to fire oil, during any period when it is firing gas, and (c) each stationary combustion turbine which is equipped both to fire gas using diffusion flame technology and to fire oil, and is located at a major source where all stationary combustion turbines fire oil no more than an aggregate total of 1000 hours during the calendar year.

- Diffusion Flame Oil-Fired Turbines. This subcategory includes (a) each stationary combustion turbine which is equipped only to fire oil using diffusion flame technology, and (b) each stationary combustion turbine which is equipped both to fire oil using diffusion flame technology and to fire gas, and is located at a major source where all stationary combustion turbines fire oil more than an aggregate total of 1000 hours during the calendar year, during any period when it is firing oil.

The EPA expects that the majority of distillate oil burned in stationary combustion turbines will be fuel oil number 2. The EPA recognizes that stationary combustion turbine owners and operators may burn different varieties of distillate oil, however it is believed that any other distillate oil combusted will be of similar quality and composition to fuel oil number 2. The EPA does not anticipate that owners and operators will burn any other liquid based fuel that is more contaminated with metals than fuel oil number 2 and expects that most available liquid fuels that may be used in stationary combustion turbines will be similar and fairly consistent.

B. MACT Floor and MACT for Lean Premix Units

IV.B.1 Comment: Several commenters took issue with the methodology and data used to set the MACT Floor for LPC units. Two commenters (427, 460) contended that EPA's determination of the floor for existing LPC is fundamentally flawed. Reliance on a single data point and the assumptions made to compensate for the inherent error and variability are arbitrary and capricious, therefore EPA must obtain additional information before it can set a floor.

Two commenters (430, 440) stated that data from all five CTs should be used to set the MACT floor for existing LPC turbines. Commenter 440 determined that the formaldehyde limit should be 219 ppb (this option is recommended only if EPA declines to set the floor as no emission reduction).

Six commenters (424, 431, 484, 485, 488, 501) remarked that the MACT floor for new and existing LPC turbines does not reflect a reasonable estimate of formaldehyde emissions achieved in practice by the best-performing source; EPA should adjust the MACT floor to reflect formaldehyde emissions reasonably expected over the operating range of the best-performing LPC turbine. One commenter (519) observed that EPA's use of the performance test of one "best" LPC unit is not statistically viable and does not meet the statutory requirement for setting the MACT floor.

Two commenters (437, 502) said that EPA's emission standard for LPC CTs is unlawful and EPA should establish a "no control" emission limitation. The EPA did not determine that the best performers in the subcategory were "controlling" their emissions in a duplicable manner. The EPA improperly set the floor for the existing LPC subcategory; EPA based the floor on the performance of the best source for which it had data, instead of basing it on the average emission limitation of the 5 sources for which it had data. Also, EPA has not considered all of the variability that either the best performers will experience or that will affect the attainability of emissions. The EPA should consider the normal turbine variations based on time, fuel, location, and weather. The EPA should also consider the repeatability of testing and monitoring methods. It is improper to set an emission standard based on the testing of one unit when there is no acceptable test method to assure that the existing test data is reasonable and that it may not be possible to demonstrate compliance.

Response: As discussed in the response to comment IV.A.2, EPA had limited emissions data at proposal for stationary combustion turbines. The EPA had five tests for formaldehyde emissions for LPC CTs, none of which were on LPC units with add-on HAP emission control. As a result of EPA's request for HAP emissions test data in the proposal, EPA received new emissions data for LPC turbines during the comment period, including two formaldehyde tests on a LPC unit equipped with add-on HAP emissions control. The new data also include several tests conducted using FTIR, which is regarded as the most accurate measurement method for formaldehyde for stationary CTs. Thus, the data set has been significantly improved, both quantitatively and qualitatively, and EPA believes that the data set is sufficient to identify the best-performing unit.

Also, as discussed in the response to comment IV.A.2, the EPA decided that it is appropriate to subcategorize based on fuel within the subcategories for DFC and LPC CTs.

As a result of comments and the new data submitted post-proposal, EPA reevaluated the MACT Floor for both existing and new LPC gas-fired units and existing and new LPC oil-fired units. For existing units in both fuel subcategories, it was determined that the average of the best performing 12 percent of existing units is no HAP emission reduction. To determine the MACT Floor for new LPC gas-fired units, the performance of the best turbine for which EPA has emissions information for was selected. The best performing turbine is equipped with an oxidation catalyst and was tested twice, separated by a period of 2 years, under the same conditions. The formaldehyde was measured to be 19 ppb and 91 ppb during the testing. These tests were conducted using CARB 430 and a bias factor was applied to the reported results; this

is discussed in greater detail in the response to comment V.A.1 and in memoranda available in the rulemaking docket. The MACT Floor was set at the higher measurement of 91 ppb to account for the variability of the best performing unit.

For new LPC oil-fired units, EPA does not have any formaldehyde emissions data. However, it is expected that the level of control achieved by the application of oxidation catalyst control to LPC gas-fired units would be equivalent to the level of control achieved by applying an oxidation catalyst to a LPC oil-fired unit. Based on data that show that for DFC units, formaldehyde emissions are lower for distillate oil, it is also expected that the formaldehyde emissions from LPC oil-fired units would be equal to or less than the formaldehyde emissions from LPC gas-fired units. As a result, the MACT Floor for new LPC oil-fired CTs is the same as the MACT Floor for new LPC gas-fired CTs, a formaldehyde emission limitation of 91 ppb.

The EPA examined the inventory database to identify any operating practices which could affect metal emissions and was unable to identify any such practices. The EPA also referred to the inventory database to determine if any existing lean premix stationary combustion turbines firing distillate oil were equipped with emission controls for the reduction of PM which would also reduce metal emissions. No such units were found in the inventory database and none were identified by commenters during the public comment period.

IV.B.2 Comment: Three commenters (422, 440, 479) believed that the MACT floor for existing LPC units should be no emissions reductions, while one commenter (427) said that existing LPC units should be exempted from the standard.

Response: The EPA agrees with the commenters that the MACT floor for existing LPC units should be no emissions reductions. The EPA does not agree that existing LPC units should be exempted from the standard but notes that these units have no emission limitations or operating limitations in the final rule.

IV.B.3 Comment: One commenter (426) observed that EPA did not undertake any MACT floor analysis for existing LPC CTs related to the use of oxidation catalysts. The commenter said that EPA should determine the MACT floor, and it should not be 95 percent reduction because the level of control achieved by the average of the best performing 12 percent of existing sources would be significantly less than 95 percent.

Response: For existing sources, EPA is required to set the MACT floor at the emission level achieved by the average of the best performing 12 percent of existing sources. As discussed in the response to comment IV.B.1, EPA has re-analyzed its data set and determined that the MACT floor for existing gas-fired and oil-fired LPC units is no emission reduction.

IV.B.4 Comment: One commenter (424) asserted that the low concentrations of formaldehyde used to set the MACT floor are suspect and should have been observed on more than five representative turbines. Detection levels for measurement methods are closer to 100 ppb.

Response: The EPA does not agree with the commenter. After proposal of the CT NESHAP, EPA received additional source test reports that included testing of formaldehyde emissions from LPC CTs. These tests showed that the measurement methods are capable of detecting levels of formaldehyde lower than 100 ppb. The EPA consulted with several experts in the measurement of formaldehyde using FTIR and they indicated that detection levels of as low as 10 ppb were possible. This is discussed in much more detail in the response to comment VII.A.2.1.

IV.B.5 Comment: One commenter (472) said that the MACT Floor for existing LPC CTs is unlawful. The floor (formaldehyde) is at a level far worse than the emission levels achieved by the best source. The 95 percent reduction standard is unlawful because it does not even purport to reflect the actual emission levels achieved by the relevant best sources. Also CO is not a valid surrogate.

Response: As discussed in the response to comment IV.B.1, EPA reevaluated the MACT Floor for existing gas-fired and oil-fired LPC units as a result of comments and the new data submitted post-proposal. The EPA does not agree that CO reduction is not a valid surrogate for HAP reduction. As stated in the response to comment VI.A.1, the alternative CO emission limitation has been removed from the final rule due to CO measurement difficulties. Thus, the commenters' concerns are moot. The EPA has determined that formaldehyde is an appropriate and valid surrogate for each of the organic HAP that can be controlled by a catalyst, and that the standard for such organic HAP can be reasonably expressed in terms of formaldehyde emissions measured after exiting any control device.

IV.B.6 Comment: One commenter (472) stated that the MACT Floor for new LPC units does not reflect the actual performance of the single best source and is therefore unlawful, arbitrary, and capricious.

Response: As explained in the response to comment IV.A.6, EPA believes that it must accommodate intrinsic variability in performance when setting a standard which is based on the performance of the best controlled similar source. It would make no sense to adopt a standard based on the best controlled source which could not be consistently met even by that source.

IV.B.7 Comment: One commenter (504) recommended that the standard for LPC CTs should be technology based: the use of lean premix combustion.

Response: The EPA thinks it is inappropriate to base the standard for a subcategory on a characteristic which is intrinsic to all sources in that subcategory. Rather, EPA must consider additional characteristics of the sources within the subcategory which would be associated with reduced HAP emissions. In this instance, for each of the fuel specific subcategories within lean premix turbines, EPA has determined that the only measure which would materially reduce HAP emissions is the installation of an oxidation catalyst. This technology is not utilized by the average source for the existing source MACT floor determination, but it is utilized by the best controlled similar source. Even if EPA was to determine that the use of lean premix technology

alone was a valid basis for a standard, the standard must still be expressed in quantitative terms (as a percentage of control or a level of emissions) rather than as a type of technology, unless EPA makes the determination required for a design, equipment, work practice, or operational standard under CAA section 112(h).

IV.B.8 Comment: One commenter (472) remarked that for MACT, EPA's rejection of potential control technologies that might be applied, including wet scrubbers, dry scrubbers, and activated carbon, without even considering them is arbitrary, capricious, and unlawful. The EPA's argument that a greater degree of reduction could not be achieved through the use of clean fuels is unlawful, arbitrary, and capricious.

Response: The EPA agrees with the commenter that the effect of the choice of natural gas or fuel oil on the composition of HAP emissions is significant, and EPA has therefore subcategorized further within both lean premix and diffusion flame turbines based on which of these fuels is used. The EPA is not aware of any data indicating that HAP emissions could be consistently reduced by selection of particular clean fuels within these general fuel groups. As for the other novel emission control technologies to which the commenter refers, EPA does not believe that these technologies are in use on any combustion turbine and EPA does not consider any sources utilizing such controls to be similar sources. Moreover, EPA is unable based on available information to determine that these technologies would be both efficacious and cost effective in reducing HAP emissions from combustion turbines.

IV.B.9 Comment: One commenter (440) expressed the view that EPA's decision not to set "beyond-the-floor" emission limitations is permissible.

Response: The EPA agrees with the commenter that its decision not to set "beyond-the-floor" emission limitations is permissible.

C. MACT Floor and MACT for Other Subcategories

IV.C.1 Comment: One commenter (472) remarked that for existing emergency, limited use, landfill or digester gas fired, and less than 1 MW units, EPA did not set a floor that reflects the emission levels that the best performing sources actually achieved. The EPA has not identified the relevant best performing sources and has not determined the average emission limitation achieved by such sources, therefore EPA's floors for these sources is unlawful.

Response: As noted in the response to comment I.C.1.1, EPA has not decided to establish a limited use subcategory. For the emergency, landfill or digester gas fired, and less than 1 MW subcategories, EPA has not identified any adjustments or other operational modifications that would materially reduce emissions by these units and EPA has determined that no add-on controls are presently in use. In these circumstances, EPA believes that it has appropriately established the floors for these sources as no emission reduction.

IV.C.2 Comment: One commenter (472) said that for new emergency, limited use,

landfill or digester gas fired, and less than 1 MW units, the floor is unlawful because EPA did not identify the single best controlled source in any of these subcategories and did not set floors reflecting such source's actual performance. The floors are arbitrary and capricious because EPA did not explain how its "no emissions reductions" floor satisfies the CAA.

Response: As noted in the response to comment I.C.1.1, EPA has not decided to establish a limited use subcategory. For the emergency, landfill or digester gas fired, and less than 1 MW subcategories, EPA has not identified any adjustments or operational modifications that would materially reduce emissions by these units and EPA has determined that no add-on controls are presently in use. The EPA also has determined because of the specific characteristics of turbines in these subcategories that the turbines in other subcategories that utilize add-on controls are not similar sources. In these circumstances, EPA believes that it has appropriately determined that the new source MACT floor for these subcategories should also be no emission reduction.

IV.C.3 Comment: One commenter (472) contended that EPA's rejection of beyond the floor standards for new emergency, limited use, landfill or digester gas fired, and less than 1 MW units is arbitrary and capricious. The EPA does not state the cost of applying any control technology or indicate the quantity of the HAPs that would be reduced.

Response: The EPA believes that the record includes analysis demonstrating that it is not cost effective to require HAP controls for turbines in instances where no similar source has installed such controls.

IV.C.4 Comment: One commenter (440) noted that for emergency and limited use units, the determination that MACT floor is no emission reduction is lawful because EPA determined that the best-performing source were not achieving emissions reduction through the use of an emission control system and there were no other methods by which CTs could reduce HAP emissions.

Response: The commenter's support is acknowledged by EPA.

IV.C.5 Comment: One commenter (440) said that EPA's decision not to set "beyond-the-floor" emission limitations is permissible for stationary CTs combusting digester or landfill gas.

Response: The commenter's support is acknowledged by EPA.

D. Other

IV.D.1 Comment: One commenter (421) urged EPA not to impose limits and/or controls on existing or new stationary gas CTs if EPA does not delist them.

Response: The commenter did not give any rationale for this suggestion. The EPA is

required by the CAA to set MACT standards for these units.

IV.D.2 Comment: One commenter (472) said that EPA's proposal is unlawful because EPA must set standards for each listed HAP. Oxidation catalyst control devices do not control many of the HAPs that CT emit, for example metals.

Response: The EPA does not agree that it is required to establish a discrete standard for each listed HAP. However, EPA does agree that each listed HAP must be separately considered by EPA, both in determining the MACT floors and in establishing the emission standards for each subcategory. If emissions of a particular HAP are relatively homogenous for a particular subcategory, and there are no adjustments or operational modifications except for add-on controls which would reduce emissions of that HAP, the MACT floor and the emission standard for that HAP may be expressed as a level of emission reduction corresponding to the efficacy of add-on controls. Moreover, if the data demonstrate that control of emissions of a particular HAP is a suitable surrogate for control of emissions of a group of listed HAP, EPA may appropriately set the standard in terms of a level of emission reduction or an emission level for that particular HAP.

In establishing new source standards for certain subcategories, EPA determined that formaldehyde is an appropriate surrogate for the other organic HAP which are also controlled by an oxidation catalyst. While use of an oxidation catalyst does not control the metallic HAP which are emitted by turbines burning distillate oil, there are no combustion turbines or similar sources utilizing other technologies to control metallic HAP. Moreover, EPA does not believe it would be practical or cost effective to require control of these metallic HAP, and therefore the floor and the standard for each metallic HAP was appropriately set at no emission reduction.

IV.D.3 Comment: One commenter (502) stated that EPA should interpret *National Lime II* as requiring it to set emission standards only for those HAPs emitted, or at most, reasonably expected to be emitted by units in the source category.

Response: The EPA agrees with the commenter.

IV.D.4 Comment: One commenter (472) noted that EPA's floors must reflect the average emission levels achieved by the relevant best sources. Thus, even if some of the relevant best sources are not using any control device, the agency must average their performance with that of the relevant best sources that are using a control device. That some of the relevant best performers are not using an end-of-stack control technology does not allow EPA to discount the performance of other best performers that are using such technology.

Response: The EPA does not agree with the premise of this commenter that the existing source MACT floor (the average emission limitation achieved by the best performing 12 percent of existing sources or the best performing 5 existing sources in subcategories with fewer than 30 sources) must be calculated by determining the arithmetic average of the emission limitations achieved individually by each of these sources. The EPA has consistently construed the statute

to permit EPA to determine the average emission limitation by selecting the median facility among the best performing 12 percent or 5 existing sources. The EPA thinks this well-established construction of the statute is reasonable, because an arithmetic average will quite often not coincide with the level of emission reduction that has been achieved in practice by any real facility. The EPA does not think it is appropriate to establish an existing source MACT floor which may not be achievable by most of the sources from which it was derived. Nor does EPA think it is required to set a standard which is less stringent than most of the sources from which it is derived are achieving. Use of the emission limitation achieved by the median facility avoids these problems.

IV.D.5 Comment: One commenter (502) expressed the view that EPA is on firm ground controlling and measuring a surrogate for HAPs as long as it can show the barest of correlation. The EPA can require direct control and measurement of a HAP or use surrogate control.

Response: The commenter's support is acknowledged by EPA.

IV.D.6 Comment: One commenter (502) had the opinion that EPA still retains the authority to discover what the best performers achieve and how they achieve it as part of their floor analysis. If that methodology is reproducible by others, then it is a legitimate basis for the MACT floor standards. The EPA is not required to use an "emissions-based" approach.

Response: The commenter's support is acknowledged by EPA.

IV.D.7 Comment: One commenter (502) noted that EPA has the authority to determine that the floor is no control. Section 112(d) requires EPA to discover what the best performers achieve and how they achieve it as part of their floor analysis. If the methodology is not reproducible by others then the emissions achieved by the least HAP emitting source is subject to the same variability as any other source in the category. Consequently there is no activity that the "best performers" are conducting that can be duplicated by the other "lesser" performers in the category to achieve a specified limit. Therefore a floor based on what the best performers achieve is impossible to set, and a "no control" floor is appropriate.

Response: The commenter's support is acknowledged by EPA.

IV.D.8 Comment: One commenter (502) observed that in the *CKRC* case, the court did not address EPA's duty to consider reproducibility by others in the source category. If another source is physically unable to replicate what the best performers do, EPA could consider the floor determination inapplicable because it is not representative of that category and therefore not a "similar source."

Response: The EPA agrees with the commenter.

IV.D.9 Comment: One commenter (502) stated that EPA can establish the MACT floor based on work practice standards.

Response: The EPA agrees that work practice standards can be established, but is usually only done when it is not possible to set an emission limitation, which is not the case for this rule.

V. EMISSION LIMITATIONS

A. Formaldehyde

V.A.1 Comment: Twenty-three commenters (418, 421, 422, 424, 425, 426, 427, 430, 431, 435, 436, 437, 442, 443, 449, 460, 475, 479, 482, 505, 508, 509, 519) took issue with the data used to set the formaldehyde emission limitation. The commenters noted that the test reports used to set the limit used two different test methods and that the limit was based on only five data points and therefore does not reflect a level of performance that is achievable for all sources. Commenter 443 said that EPA has not provided enough data to know definitively what the standard should be. Commenter 460 stated that EPA must obtain additional information before it can set a floor.

The commenters also had concerns about possible errors in the test reports that are the source of the emissions data used to set the formaldehyde emission limitation. Commenter 437 said that close examination of the five reports uncovers questions regarding the actual test procedures, comparability, data reduction and data reporting that should be revisited before finalizing the formaldehyde concentration limit. All five reports appear to have calculation errors and/or other data quality issues that significantly affect the reported formaldehyde concentration, the comparability of the results because different test methods were used, and/or uncertainty associated with the average result. Commenter 449 also reviewed the five tests used to set the standard and found that all of the five tests used do not present valid quantitative results; therefore, data from these tests may not be used to establish a quantitative emission standard for formaldehyde emissions from LPC CTs.

One commenter (430) said that CARB 430 may report anomalously low formaldehyde emissions; therefore, the standard may be too stringent and unachievable in practice. Two commenters (435, 460) questioned whether the CARB 430 data used to develop the standard followed CARB method requirements. One commenter (437) believed that the results from all tests used to determine the MACT floor should be recalculated using CARB 430 procedures so the data can be justifiably compared. The results should also be recalculated using the American Society of Mechanical Engineers measurement uncertainty analysis procedure. The EPA should then use these results for establishing the formaldehyde concentration limit. The commenter estimated that an enforceable formaldehyde concentration limit should be in the range of approximately 100 to 500 ppb.

One commenter (449) said that a single emission test does not fully reflect the variability that will be seen by the best performing source employing any technology. The EPA should properly assess variability that may be experienced by the best performing sources under the

worst foreseeable conditions that are expected to recur. Emission testing conducted by the commenter in conjunction with the Gas Turbine Institute indicates that 43 ppb is not achievable for small industrial and aeroderivative turbines. This is also demonstrated by emission testing that the Wyoming Department of Environmental Quality intends to submit to EPA. The commenter also contended that pooling the emissions data for large General Electric LPC units with emission data for small industrial and aeroderivative turbines fails to recognize the inherent technical differences between these two classes of LPC CTs. The EPA should consider a MACT floor analysis for small units based on emission test data that properly represents the best performing sources within that subcategory. Preliminary analysis for small industrial/aeroderivative units demonstrates that emissions from 70 - 500 ppb have been reported.

Several commenters suggested a revised level for the emission limitation. One commenter (479) said that EPA must revise the limit upward to at least 63 ppb. Two commenters (443, 475) stated that additional formaldehyde data suggests that EPA should consider setting the emission standard to 90 ppbvd given the tremendous variability in the few measurements that are available. One commenter (505) submitted a summary table of data for nine tests conducted on LPC CTs; the test results show a variability between high and low loads of 34 percent, also six out of nine tests were above 43 ppb.

One commenter (421) said that EPA should consider postponing promulgation until issues related to the data quality are fully resolved.

Response: As stated in the response to comment IV.A.2, EPA had limited emissions data for stationary combustion turbines at proposal. Due to the limited amount of emissions data EPA had at proposal, EPA requested HAP emissions test data from stationary combustion turbines in the proposed rule. As a result of this request, EPA received new data in the form of several test reports during the comment period and has more than doubled its total data set. Data were received for both diffusion flame and lean premix turbines. New test reports received included many tests conducted using FTIR; at proposal EPA did not have any emissions data conducted using FTIR. Therefore, EPA's data set has been significantly improved, both quantitatively and qualitatively.

As a result of comments received during the comment period, EPA performed an extensive review of tests used at proposal and new tests received during the comment period. A screening analysis of the formaldehyde test data for diffusion flame combustor turbines was conducted. Tests conducted using CARB 430 were evaluated due to the CARB advisory issued April 28, 2000, which stated that formaldehyde data measured by CARB 430 where the NOx emissions were greater than 50 ppm should be flagged as non-quantitative. Tests where the NOx emissions were greater than 50 ppm or tests where the NOx levels were unknown were excluded from EPA's analysis. Most of the diffusion flame tests in the Emissions Database were unable to pass the screening. The tests unable to pass the screening were not equipped with add-on control for the reduction of HAPs.

The remaining test reports were further analyzed and reviewed to ensure the methods were used correctly in calculating and reporting formaldehyde concentrations and to check that proper QA/QC procedures were followed. A number of errors were found in the test reports where CARB 430 was used to quantify formaldehyde concentrations. In several instances the CARB 430 reporting protocol was not followed. If the analytical concentration is less than five times the average field blank, then CARB 430 uses five times the field blank as the reported result to correct for interferences or contaminants that can react with the formaldehyde or dinitrophenylhydrazine to yield negative bias. However, many test reports did not report formaldehyde concentrations in this fashion. The formaldehyde concentrations were therefore recalculated where the CARB 430 reporting protocol was not followed correctly. General Electric (GE) proposed a method for blank correcting in their comments on the proposed NESHAP for stationary combustion turbines. A copy of GE's comments can be obtained from EPA's Edocket Website as Document ID Number OAR-2002-0060-0435. The EPA evaluated formaldehyde emissions estimated using both blank correction procedures (CARB 430 reporting protocol and proposed GE method), however, EPA chose the CARB 430 protocol because its results are closer to FTIR (considered the most accurate method) and the correlations to FTIR for both protocols were similar.

No errors were found in test reports which used FTIR to measure formaldehyde concentrations in the stationary combustion turbine exhaust. The reported formaldehyde concentrations were representative of stationary combustion turbines and the measured QA/QC parameters were within acceptable limits as set in the method.

The EPA agrees that CARB 430 generally understates the formaldehyde concentration in the exhaust gas from stationary combustion turbines. Since EPA Method 0011 is a similar method to CARB 430, it is believed that Method 0011 also understates the emissions of formaldehyde. The EPA feels that FTIR is a more accurate and reliable method. Several test reports were received during the comment period on recent testing on small lean premix combustion turbines which used both CARB 430 and FTIR to measure formaldehyde emissions. An analysis was conducted to correlate formaldehyde concentrations measured by CARB 430 and formaldehyde concentrations measured by FTIR. A linear regression was performed on the CARB 430 and FTIR formaldehyde data from these tests which gave a slope of 1.667 with a correlation coefficient of 0.561. Therefore, EPA concluded that CARB 430 formaldehyde results are on average 1.7 times lower than FTIR formaldehyde results. To account for the differences in the methods, a bias factor of 1.7 was applied to the CARB 430 and Method 0011 formaldehyde emissions data to make these data comparable to FTIR.

As a result of a complete data review including emissions data EPA had at proposal and new emissions data EPA received during the comment period, EPA currently has a very different data set as compared to what it had at proposal. For example, the amount of data for LPC units increased, while the amount of data for DFC units decreased. The new data set includes more emissions data on smaller units as compared to the data set at proposal. As discussed in the responses to comments IV.A.2 and IV.B.1, the new data set was used to determine the MACT Floors. For new LPC gas-fired units and new LPC oil-fired units, a formaldehyde emission

limitation of 91 ppb was established for the MACT Floor. It is believed that this emission limitation will be achievable for both small and large size CTs. The EPA considered establishing separate subcategories by size but found that there was little difference among the best performing small and large units. The best performing large LPC unit was controlled by an oxidation catalyst and had formaldehyde emissions of 19 and 91 ppb. The best performing small LPC unit (< 25 MW) had uncontrolled formaldehyde emissions of 68 ppb, which is within the range of emissions for the large LPC unit.

The EPA believes that it has adequately considered the variability in emissions by the best performing source. The EPA has emissions data for two tests for the best performing turbine in the LPC gas-fired turbines subcategory; the formaldehyde emissions varied by a factor of 4.8 between the two tests. Since both tests were performed under similar conditions but at different times, they represent the variability of the best performing unit. The MACT floor for this subcategory was set based on the higher formaldehyde measurement, thus the variability of the best performing unit has been accounted for. Similar variability factors were applied for the other subcategories.

V.A.2 Comment: One commenter (488) requested that a mass based emission limit be included as an alternative to the concentration based standard for LPC CTs. Two commenters (424, 427) recommended that EPA add a formaldehyde ton per year emission limit alternative.

Response: The EPA does not agree with the commenters. As stated in the preamble, a volume concentration was chosen for the emission limitation because it can be measured directly and is clearly related to the performance of the HAP reduction technology.

V.A.3 Comment: One commenter (443) stated that LPC units that do not meet the formaldehyde standard but are in compliance with the NO_x limit should not be required to install additional controls.

Response: The EPA does not agree that units that are not meeting the formaldehyde emission limitation should not be required to install additional controls. Our analysis of the MACT Floor shows that the best performing LPC unit is equipped with add-on HAP emission control.

V.A.4 Comment: Three commenters (421, 424, 502) contended that a contradiction exists between the proposed formaldehyde standards of 17,000 ppb for RICE and 43 ppb for CTs. Commenter 421 stated that the CT rule would discourage owners to acquire clean burning turbines, promoting reduced air quality.

Response: The EPA is required to regulate stationary combustion turbines and to set MACT according to the provisions set forth in the CAA. The emission standards for other MACT rules do not have any relevance when setting MACT for stationary combustion turbines.

V.A.5 Comment: One commenter (424) requested that the standard value be stated in

the same units of measurement of similar formaldehyde combustion source standards, e.g. RICE, for ease of comparison. The commenter asked that any formaldehyde emission level in the final rule be denoted in ppm units rather than ppb.

Response: The EPA believes that it is not necessary to state the emission limitation in the same units of measurement as other combustion source standards. The EPA believes that ppb is the most appropriate unit for this standard; units are not selected on the basis of ease of comparison with other standards.

V.A.6 Comment: One commenter (436) expressed the opinion that the formaldehyde emission limitation could increase the use of diffusion-flame turbines and RICE, resulting in substantial increase in emissions.

Response: The EPA does not agree that the formaldehyde emission limitation would increase the use of DFC CTs and RICE. The commenter did not provide any clarifying information to explain why the use of DFC CTs would be increased. New DFC units are subject to this rule and have emission limitations; the EPA has also proposed a NESHAP for stationary RICE which includes similar requirements to this rule, i.e. formaldehyde limits. Therefore there would be no incentive to use these units instead of LPC units. In addition, limitations for other pollutants, such as NOx, are also a factor.

V.A.7 Comment: One commenter (436) observed that variations in atmospheric methane can result in variation in formaldehyde levels that exceed the proposed level of 43 ppbvd.

Response: The EPA agrees with the commenter that atmospheric levels of formaldehyde could be as high as 43 ppbvd. However, EPA believes that any ambient formaldehyde would be combusted in the turbine and would have little effect on the stack levels of formaldehyde.

V.A.8 Comment: One commenter (417) stated that the 43 ppbvd limit should be changed to 25 ppbvd because EPA did not consider data provided to the CT MACT Work Group on tests performed on CTs using two different emission control technologies that resulted in substantially lower formaldehyde and HAP emissions. According to the commenter, both technologies demonstrated the ability to guarantee formaldehyde emissions of less than 25 ppbvd. Therefore, EPA should consider the HAP advantages provided by these control technologies when determining the formaldehyde limit.

Response: The commenter did not provide any details about whether these technologies are commercially available and if they can be retrofit on existing units. Without any information regarding the feasibility and availability of these control technologies, EPA is unable to address the concern directly. As a result, EPA is not changing the NESHAP in response to this comment.

V.A.9 Comment: One commenter (502) remarked that the formaldehyde limit is not

justified considering the relatively small risks associated with the HAPs being emitted by the CT category.

Response: Risk is not a consideration in establishing emission standards under CAA section 112, except in those limited instances where an alternate standard for a threshold pollutant can be established pursuant to CAA section 112(d)(4).

V.A.10 Comment: One commenter (435) requested that the rule allow the EPA Administrator to enter into agreements with a manufacturer of lean pre-mix combustion turbines to certify as compliant with the 43 ppb formaldehyde standard each model or other class of turbine that its testing demonstrates meets the standard. Notice of each proposed agreement could be published in the Federal Register, with an opportunity for public comment prior to finalization of the agreement.

Response: The EPA believes that performance testing and continuous parametric monitoring is a better method to determine continuous compliance than a one-time factory test. The EPA therefore does not agree with the commenter.

B. CO

V.B.1 Comment: Twenty-seven commenters (412, 418, 419, 420, 421, 422, 424, 425, 426, 427, 430, 431, 437, 440, 442, 443, 444, 445, 446, 449, 460, 475, 479, 484, 502, 508, 509) urged EPA to revise the CO emission limitation of 95 percent reduction because it does not represent actual emission reductions achievable by oxidation catalysts since it is based solely on two tests from a catalyst vendor, and it does not account for variability in catalyst performance. The commenters also noted that catalysts may not achieve the same level of CO reduction for multiple years and recommended that the rule provides for potential long-term degradation of catalyst performance in practical turbine applications.

Three commenters (424, 427, 449) said that it is inappropriate for EPA to rely on emissions data for the $SCONO_x$ (EM_x^{GT}) system to establish the emission performance achieved by traditional, passive oxidation catalysts. One commenter (430) questioned whether the reductions reported by the catalyst vendor have been achieved in practice by an operating CT owned and operated independent of the vendor. Two commenters (430, 449) observed that the $SCONO_x$ catalyst operates in temperature range of 300 - 700°F, consequently a heat exchanger may be required to lower the exhaust gas temperature, at significant additional cost. One commenter (449) remarked that the emission testing conducted for the $SCONO_x$ system represents inflated performance in terms of CO percent reduction due to the high CO levels at the inlet to the $SCONO_x$ system.

Eight commenters (420, 422, 443, 446, 460, 475, 479, 502) stated that 90 percent reduction of CO is a more appropriate emission limitation. One commenter (419) stated that they have catalysts that have been achieving about 90 percent reduction, not 95 percent. One commenter (430) noted that they have found it impossible to achieve 95 percent reduction, and

that EPA has not shown 95 percent is achievable in practice. One commenter (437) recommended that the limit be set at 75 percent reduction. Two commenters (442, 449) advised that the reduction should be set at 88 percent. The basis for a limit of 88 percent is review of recent permitted emission limits for turbines with catalysts and confirmed by two recent CARB BACT assessments. Two commenters (424, 427) felt that 80-90 percent reduction is more appropriate for new CTs; for existing CTs, insufficient data exists to set a percent reduction level for retrofit applications as the temperature window available for the retrofit catalyst may not be within the optimum temperature range for the catalyst. Two commenters (426, 430) noted that in the preamble to the proposed rule, EPA reviewed design data from catalyst vendors and determined that the typical emission reduction for CTs is 90 percent CO reduction, with only a few systems designed to meet greater than 95 percent. One commenter (430) stated that the MACT floor should be as required by section 112(d)(3)(A) of the CAA, the level of control achieved by the average of the best performing 12 percent of existing sources, and therefore would likely be significantly less than 95 percent reduction.

Also, two commenters (431, 484) requested that the CO reduction requirement be reduced for retrofit installations of oxidation catalyst on existing LPC turbines.

Response: The EPA believes that 95 percent reduction of CO is achievable through the use of oxidation catalyst control. The percent reduction is a design parameter of the oxidation catalyst control system. The costs for proper design and operation of such a system were included in our analysis. The EPA does not agree with the commenters' statements that 95 percent reduction is not achievable, however, as discussed in the response to comment VI.A.1, the alternative CO emission limitation has been removed from the final rule due to CO measurement difficulties. Thus, the commenters' concerns are moot.

V.B.2 Comment: Twenty-seven commenters (412, 419, 420, 422, 424, 425, 426, 427, 430, 431, 435, 437, 442, 446, 449, 465, 469, 470, 475, 482, 484, 485, 488, 501, 502, 505, 518) requested that a CO outlet concentration limit option be added. Five commenters (435, 437, 446, 475, 505) recommended that EPA specify a CO emission limitation of 5 ppm. Two commenters (485, 501) recommended a CO limitation of 1 ppm. Two commenters (424, 427) suggested that EPA provide that CTs emitting less than 50 ppm CO at full load would comply with the MACT standard. One commenter (449) recommended an outlet standard of 6 ppm, based on the BACT recommendation by CARB for turbines rated 3 MW to 50+ MW. One commenter (425) stated that EPA could set the standard based on review of recent BACT/LAER determinations. One commenter (426) recommended an outlet standard of 3 ppmvd at 15 percent O_2 for CTs equipped with catalyst and new LPC CTs. A separate rate should be set for CTs not equipped with catalyst (limit would be greater than 3 ppmvd). A CO limit of 5-10 ppmvd is reasonable for new DFC CTs. One commenter (518) said that EPA should review the existing data correlating CO emissions with formaldehyde emissions (and collect additional data if necessary) to determine the limit. The commenter believed the limit would be in the 2 to 5 ppm range (New Jersey has recently permitted LPC CTs with oxidation catalysts with allowable CO emissions in the range of 2 to 5 ppmvd at 7 percent O_2).

Commenter 505 noted that a single emission limit for CO would reduce the costs of compliance and negate the need to use inadequate test methods to determine compliance with the formaldehyde limit. Two commenters (465, 470) remarked that a single CO concentration limit would lessen the amount of record keeping for affected facilities by not having to collect two CO concentrations and calculate the percent reduction.

Response: The emissions data at the time of proposal showed that CO reduction across an oxidation catalyst was strongly correlated to HAP reduction, while the CO concentration and HAP concentration was not. Thus, it would not have been appropriate to have a CO outlet concentration limit.

V.B.3 Comment: One commenter (424) said that the addition of a catalyst to reduce CO emissions will result in CO being subject to regulation as a HAP.

Response: The concern raised by the commenter is moot because this rule does not have any requirements for CO. However, as discussed in the response to comment VI.A.1, the alternative CO emission limitation has been removed from the final rule due to CO measurement difficulties. Therefore the EPA does not feel that it is appropriate to establish a CO outlet concentration limit.

V.B.4 Comment: One commenter (472) asserted that EPA's claim that a CO standard will result in some unspecified degree of reduction in some unidentified HAP falls far short of establishing an adequate surrogacy relationship between CO and the other HAPs. Furthermore, one commenter (436) stated that no correlation between CO and formaldehyde emissions at sub-ppm levels has been demonstrated. The role of atmospheric CO levels on the development of a CO-formaldehyde correlation must be examined. The CO in the exhaust may bear no relationship to the HAPs generated by the turbine if a significant percentage of air used in the CT bypasses the combustion zone. Likewise, commenter 424 said that a correlation between CO and formaldehyde emissions should exist, yet this correlation is hard to establish due to current measurement problems. To provide an acceptable surrogate for formaldehyde measurement, a precise, repeatable correlation must be established.

Similarly, one commenter (445) did not agree that there is a relationship between CO reduction and HAP reduction. Instead, the commenter believed a relationship exists between VOC and HAP. EPA's proposal to use CO reduction as a surrogate for HAP reduction will not accurately reflect a like reduction.

Response: As stated in the response to comment VI.A.1, the alternative CO emission limitation has been removed from the final rule due to CO measurement difficulties. Thus, the commenters' concerns are moot.

C. Duct Burners

V.C.1 Comment: Three commenters (422, 431, 484) sought an allowance for site

specific emission limits where duct burners are utilized and the formaldehyde limit applies. Three commenters (422, 431, 502) recommended that facilities should be allowed to either accept the formaldehyde limit at the stack with the duct burner in operation, or be allowed to petition the EPA for an alternate (higher) formaldehyde limit for the combined turbine/duct burner co-firing.

Response: The EPA has incorporated the commenters' suggestions that facilities be allowed to accept the formaldehyde limit at the stack with the duct burner in operation. The EPA does not believe it is necessary to specify in the rule that affected sources are allowed to petition EPA for an alternate formaldehyde limit.

V.C.2 Comment: Two commenters (443, 486) observed that in some cases there is no means to separately monitor CO/HAPs from the turbine and duct burner, because the catalyst may be after the duct burner. Two commenters (508, 509) remarked that EPA should address and resolve compliance and monitoring issues for combined cycle units using duct burners.

Response: The EPA acknowledges that in some cases it may not be possible to separately monitor emissions from the turbine and duct burner. The final rule has been revised to allow sources to meet the limit with their duct burner in operation if they choose to do so.

D. Other

V.D.1 Comment: One commenter (431) recommended that sources be able to choose to meet either a CO percent reduction, CO outlet concentration limit, or a formaldehyde concentration limit.

Thirteen commenters (418, 420, 425, 426, 430, 431, 440, 442, 443, 449, 469, 471, 475) requested that CTs with oxidation catalysts be allowed to comply with the formaldehyde emission limit. Commenter 469 noted that uncontrolled CO emissions from a LPC turbine are inherently low, making it difficult to achieve compliance with a 95 percent reduction limit.

Response: As stated in the response to comment VI.A.1, the alternative CO emission limitation has been removed from the final rule due to CO measurement difficulties. Thus, the comment is moot.

V.D.2 Comment: Eight commenters (418, 420, 424, 425, 427, 430, 442, 449) stated that the rule should only apply emission standards to the load range represented by the emissions data used to determine emission limitations. Commenters 430 and 424 said that the emission standard should apply only at full load. Commenter 420 said the emission standards should only apply within a 60 to 100 percent base load range. Commenter 449 advised that EPA should specify in the final rule that the performance test should be conducted at full-load conditions. Full load should be defined as 100 percent ±10 percent and owner/operators should be allowed to conduct the performance test at any load condition within that range.

Response: The emission standards are based on data from testing at high loads (90 percent and greater). To address the concerns expressed by the commenters about the emission standards being applicable at full load only, the final rule specifies that the performance test must be conducted at high load conditions, defined as 100 percent ±10 percent.

V.D.3 Comment: Two commenters (442, 449) contended that the emission standards should only apply for ambient temperatures ranging from 0°F to 100°F (this is the range typically guaranteed by the manufacturer). One commenter (427) said that firing temperature was not considered in the rationale for setting the emission limitations.

Response: The EPA does not have any information to indicate that there would be a significant technological problem to operate turbines at ambient temperatures below 0°F and above 100°F and the commenters did not provide any information to support their comment. Information provided by operators of turbines on Alaska's North Slope indicated that they have experienced problems with turbine operation during cold temperatures but the temperatures on the North Slope are well below 0°F for sustained periods (they provided the supporting temperature data). The information provided by the North Slope turbine operators was based on actual operating experience, not manufacturer guarantees. In the absence of any information to support the request to apply the emission standards only at ambient temperatures between 0°F and 100°F, EPA does not agree with this comment.

V.D.4 Comment: One commenter (412) expressed support for the development and potential use of alternative control technologies to reduce HAP emissions.

Response: The commenter's support is acknowledged by EPA.

V.D.5 Comment: One commenter (443) stated that EPA's suggestion that the CO CEMS requirement could be replaced with a requirement to demonstrate a percent reduction in formaldehyde is unreasonable.

Response: The EPA does not agree that a requirement to demonstrate a percent reduction in formaldehyde is unreasonable, however, the final rule does not contain such a requirement.

V.D.6 Comment: One commenter (505) remarked that in the first paragraph under section II.D of the proposal preamble ("What Are the Emission Limitations and Operating Limitations"), the phrase "new or reconstructed" should be removed from item (2).

Response: The EPA is in agreement that phrase "new and reconstructed" should not have been in item (2). The phrase should also not have been in item (1).

V.D.7 Comment: Three commenters (421, 437, 460) argued that EPA's data demonstrate that there is no substantive difference in formaldehyde emissions between DFC and LPC CTs. A no control standard should therefore be issued for both the DFC and LPC combustion system design, i.e. all gas turbines. The commenters cited data from ICCR database

- 11 non-DLN turbines were reported with emission concentrations to be less than 44 ppb. The commenters questioned the accuracy of test methods. Also cited was a GRI/EPRI report that shows that installation of a DLN combustor configuration on a gas turbine, all other components being equal, does not result in a reduced emission level of formaldehyde and based on questionable measurement accuracy any differences on a ppb level are negligible.

Response: The EPA does not agree with the commenters' contention that there is no substantive difference in formaldehyde emissions between DFC and LPC CTs. Emissions data at the time of proposal showed a difference in HAP emissions between DFC and LPC units; the data received since proposal continues to support this conclusion. An examination of formaldehyde test data for both DFC and LPC CTs shows that uncontrolled formaldehyde emissions for stationary LPC units are significantly lower than those of stationary DFC units. The difference varies, but uncontrolled DFC CTs emit on average about five times more HAP as compared to uncontrolled LPC CTs.

V.D.8 Comment: One commenter (415) said that the standards should be cut by 50 percent.

Response: The commenter did not provide any details or supporting details about why the standards should be cut by 50 percent. Thus, EPA is unable to address the comment directly.

V.D.9 Comment: One commenter (421) believed that there are significant data quality issues with the Emissions Database. The commenter recommended that the National Academy of Sciences or the National Academy of Engineering review the database for data quality.

Response: As stated in the response to comment IV.A.2, EPA had limited emissions data for stationary combustion turbines at proposal. Due to the limited amount of emissions data EPA had at proposal, EPA requested HAP emissions test data from stationary combustion turbines in the proposed rule. As a result of this request, EPA received new data in the form of several test reports during the comment period and has more than doubled its total data set. Data were received for both diffusion flame and lean premix turbines. New test reports received included many tests conducted using FTIR; at proposal EPA did not have any emissions data conducted using FTIR. Therefore, EPA's data set has been significantly improved, both quantitatively and qualitatively.

As a result of comments received during the comment period, EPA performed an extensive review of tests used at proposal and new tests received during the comment period. A screening analysis of the formaldehyde test data for diffusion flame combustor turbines was conducted. Tests conducted using CARB 430 were evaluated due to the CARB advisory issued April 28, 2000, which stated that formaldehyde data measured by CARB 430 where the NOx emissions were greater than 50 ppm should be flagged as non-quantitative. Tests where the NOx emissions were greater than 50 ppm or tests where the NOx levels were unknown were excluded from EPA's analysis. Most of the diffusion flame tests in the Emissions Database were unable to pass the screening. The tests unable to pass the screening were not equipped with add-on control

for the reduction of HAPs.

The remaining test reports were further analyzed and reviewed to ensure the methods were used correctly in calculating and reporting formaldehyde concentrations and to check that proper QA/QC procedures were followed. A number of errors were found in the test reports where CARB 430 was used to quantify formaldehyde concentrations. In several instances the CARB 430 reporting protocol was not followed. If the analytical concentration is less than five times the average field blank, then CARB 430 uses five times the field blank as the reported result to correct for interferences or contaminants that can react with the formaldehyde or dinitrophenylhydrazine to yield negative bias. However, many test reports did not report formaldehyde concentrations in this fashion. The formaldehyde concentrations were therefore recalculated where the CARB 430 reporting protocol was not followed correctly. General Electric (GE) proposed a method for blank correcting in their comments on the proposed NESHAP for stationary combustion turbines. A copy of GE's comments can be obtained from EPA's Edocket Website as Document ID Number OAR-2002-0060-0435. The EPA evaluated formaldehyde emissions estimated using both blank correction procedures (CARB 430 reporting protocol and proposed GE method), however, EPA chose the CARB 430 protocol because its results are closer to FTIR (considered the most accurate method).

No errors were found in test reports which used FTIR to measure formaldehyde concentrations in the stationary combustion turbine exhaust. The reported formaldehyde concentrations were representative of stationary combustion turbines and the measured QA/QC parameters were within acceptable limits as set in the method.

Due to the extensive review of the data and also the acquisition of new data, EPA feels that it has addressed the commenters concerns regarding the data quality issues with the Emissions Database.

V.D.10 Comment: One commenter (425) expressed the view that the rule discourages any control option other than an oxidation catalyst. Requiring a source to petition for approval of operating limitations creates a high degree of uncertainty for a company and shifts the burden of rulemaking from EPA to the regulated source.

Response: The EPA does not agree with the commenter. The proposed rule required sources equipped with oxidation catalyst control to meet a CO emission reduction limitation and other sources were required to meet a formaldehyde emission limitation. In the final rule, the CO emission reduction limitation has been eliminated and sources are not restricted to using oxidation catalyst control to meet the formaldehyde emission limitation. The final rule requires turbines complying with the emission limitation using oxidation catalyst control to monitor catalyst inlet temperature as an operating limitation. Sources that are not using oxidation catalyst control must petition the Administrator for approval of operating limitations (or approval of no operating limitations). The EPA is not aware of any add-on HAP control other than oxidation catalyst systems but would like to allow the use of other controls as they become available. Since there is no information on other types of controls that may be utilized in the

future, the EPA is not able to specify appropriate operating limitations at this time. Therefore, the final rule requires sources that are using other controls to petition the Administrator for approval of appropriate operating limitations.

V.D.11 Comment: One commenter (437) said that EPA should make provisions for CTs that are designed as LPC but may operate as DFC because of either ambient temperature or load variations. EPA should require that the CT meet MACT standards for LPC CTs only when in the LPC operating mode. If the turbine shifts from LPC to DFC (or a hybrid between LPC and DFC), EPA can require operation of all pollution control equipment (which will be required as a permit condition anyway), but not require the CT meet any emission limitations.

Response: In the final rule, the requirements for LPC units are the same as for DFC units. Therefore, EPA does not feel that it is necessary to make provisions for CTs that are designed as LPC but may operate as DFC, since the requirements for both types of units are not different.

V.D.12 Comment: One commenter (520) remarked that they were pleased that EPA is proposing no emission requirements for new turbines, reconstructed turbines, and existing diffusion flame turbines.

Response: The commenter is correct in stating that existing DFC turbines had no requirements in the proposed rule; this is also the case in the final rule. The EPA believes the commenter misread the requirements in the proposed rule for new and reconstructed turbines, because their statement is not correct, there were emission requirements for new and reconstructed turbines. The final rule also has emission requirements for new and reconstructed turbines.

VI. MONITORING, RECORDKEEPING, REPORTING

A. CO CEMS

VI.A.1 Comment: Twenty commenters (412, 418, 419, 424, 427, 433, 435, 437, 440, 442, 443, 449, 465, 470, 479, 485, 486, 488, 501, 502) requested that the CO CEMS requirement be removed and periodic testing/parametric monitoring be adopted. Six commenters (412, 427, 449, 465, 470, 479) cited the cost burden of a CEMS, with five of those commenters (412, 427, 449, 465, 470) noting that a requirement for CO CEMS imposes an excessive cost burden for smaller turbines. Commenter 449 also noted that CEMS have typically not been required on small turbines and personnel would not be familiar with CEMS operation and maintenance, resulting in increased capital and operating costs. Furthermore, commenter 449 felt that there would not be significant emissions reductions for the use of CEMS compared to the use of inlet temperature monitoring and periodic emission testing; the requirement is inconsistent with previous EPA decisions on monitoring, and there are deficiencies in the test methods and performance protocols. Commenter 419 questioned whether the low measurements can be made accurately and reliably on a continuous basis without jeopardizing the flexibility of facility

operations.

Many commenters recommended alternatives to the CO CEMS requirement. One commenter (475) suggested the option of monitoring compliance with a one-time performance test for CO. One commenter (443) said that an option could be reliance on a federal CO permit limit combined with periodic CO stack testing. If the permitted CO limit is relatively high, compliance with the formaldehyde limit at that level could first be determined using an initial formaldehyde test. If the CO limits/concentration are low, initial formaldehyde testing should not be necessary. The commenter recommended that EPA establish a default minimum compliance demonstration at 5 ppm. One commenter (433) recommended that EPA evaluate periodic stack tests, conducted on the same schedule as relative accuracy test audit (RATA) testing as an alternative to CEMS. At a minimum, this approach should be pursued for units with oxidation catalyst systems that would qualify as peaking units under the Acid Rain Program and are not otherwise required to conduct emissions monitoring for CO or other pollutants.

One commenter (419) said that a more workable solution would be to measure downstream CO, but only if a CEMS is already required for NO_x. A catalyst efficiency test could be performed periodically to confirm continued reduction efficiency (should include option to perform this check with portable analyzer). One commenter (440) said that if EPA includes an option to monitor CO emissions using CPMS rather than CO CEMS, a requirement to replace a catalyst bed when the pressure drop increases by more than 2 inches of water from the drop measured during the initial performance test may not be appropriate. Particular vendors are better able to specify the conditions under which catalyst replacement is warranted.

Response: In the preamble for the proposed rule, EPA solicited comments on the performance capabilities of a state-of-the-art carbon monoxide (CO) continuous emission monitoring system (CEMS) and its ability to measure the low concentrations of CO in the exhaust of a stationary combustion turbine following an oxidation catalyst control device. In general commenters did not support CO CEMS, stating that existing CO CEMS technology and EPA performance criteria are not adequate to reliably and accurately measure trace levels of CO. Due to the CO measurement difficulties, EPA has decided to remove the CO emission reduction limitation from the rule. Therefore, while EPA recognizes the concerns expressed by the commenters, measurement of CO using a CO CEMS or any other means will not be required, and the comments are moot.

VI.A.2 Comment: One commenter (518) favored the option of CO CEMS to measure CO emissions at the exhaust from a stationary CT or following an oxidation catalyst emission control device (i.e. CO outlet concentration limit monitored with CEMS).

Response: As stated in the response to comment VI.A.1, EPA does not feel that an outlet concentration limit is appropriate. Due to the CO measurement difficulties, EPA has decided to remove the CO emission reduction limitation from the rule. Therefore, the comment is moot.

VI.A.3 Comment: Two commenters (444, 475) requested that EPA provide justification

for the 4-hour averaging period or use an averaging period that is justified. Four commenters (422, 431, 437, 502) said that the averaging time for CO emissions should be extended to 24 hours to be consistent with the Boiler/Process Heater MACT.

Response: As discussed in the response to comment VI.A.1, the emission limitation for CO reduction has been removed in the final rule, thus this comment is moot. However, the EPA does not agree that the 4-hour averaging period is not justified. Gas-fired units have less variability in the feed stream than other sources such as coal-fired boilers; therefore a shorter averaging time is appropriate for those units.

VI.A.4 Comment: One commenter (488) recommended that the final rule contain provisions for using one set of CEMS that would sequentially monitor both the inlet and outlet.

Response: The EPA is amenable to using one CEMS to sequentially monitor both the inlet and outlet, however, as discussed in the response to comment VI.A.1, EPA has decided to remove the CO emission reduction limitation from the rule due to the CO measurement difficulties. Therefore, the comment is moot.

VI.A.5 Comment: Three commenters (465, 470, 471) stated that it is doubtful that representative samples can be easily and reliably obtained prior to the CO catalyst. Commenter 471 said that EPA should provide additional support and/or guidance regarding the most appropriate method for accurately measuring upstream CO emissions.

Response: The EPA recognizes the commenters' concern that there could be difficulties in measuring prior to the CO catalyst. However, as discussed in the response to comment VI.A.1, EPA has decided to remove the CO emission reduction limitation from the rule due to the CO measurement difficulties. Therefore, the comment is moot.

VI.A.6 Comment: Three commenters (422, 431, 502) felt that there is no justification for O_2 and CO_2 CEM at both inlet and outlet of catalyst; use of the outlet O_2 or CO_2 concentration is more than adequate to correct the CO concentration at both the inlet and outlet.

Response: The EPA agrees that use of the outlet O_2 or CO_2 concentration is more than adequate to correct the CO concentration at both the inlet and outlet. However, as discussed in the response to comment VI.A.1, EPA has decided to remove the CO emission reduction limitation from the rule due to the CO measurement difficulties. Therefore, the comment is moot.

B. Performance Testing

VI.B.1 Comment: Three commenters (443, 447/448, 460) requested that EPA clarify that performance testing is only required at full load. One commenter (443) said that the rule should allow sources the option to conduct tests at other loads as necessary to avoid interfering with sources' operating flexibility. One commenter (460) recommended that compliance testing

requirements in the rule account for the possibility that in some CT applications, full load may not be achievable during a scheduled compliance test.

One commenter (420) suggested that performance testing should be conducted within a 60 to 100 percent base load operating range, taking into account operating conditions used to establish applicable vendor guarantees for oxidation catalyst efficiency as well as design criteria used to develop permitted outlet CO or formaldehyde emissions limitations.

Response: As stated in the response to comment V.D.2, the emissions standards are based on emissions data from testing conducted at high loads (90 percent and greater). The EPA has addressed the commenters' concerns by clarifying in the final rule that the performance testing should be conducted at high load conditions, defined as 100 percent ±10 percent.

VI.B.2 Comment: One commenter (465) remarked that subsequent performance testing (suggest no more frequent than annually) is needed for units meeting the formaldehyde limit. There should also be some methodology for the demonstration of continuous compliance.

Response: The EPA agrees with the commenter that subsequent performance testing is needed for units meeting the formaldehyde limit. As a result of this comment, the final rule includes a requirement for annual performance testing for formaldehyde for these units. The EPA also agrees that there should be some methodology for the demonstration of continuous compliance and has designated requirements for continuous compliance in the final rule. For sources equipped with oxidation catalyst control, continuous compliance will be demonstrated by continuously monitoring the inlet temperature to the catalyst and maintaining the inlet temperature within the range suggested by the catalyst manufacturer. Sources that are not equipped with oxidation catalyst control must petition the Administrator for approval of operating limitations or approval of no operating limitations.

VI.B.3 Comment: One commenter (504) stated that the LPC subcategory should not have an initial compliance demonstration for the emission limit. No demonstration is needed if the unit has an initial compliance demonstration for its respective NO_x limit.

Response: An initial compliance demonstration that includes both formaldehyde and NOx would be necessary to establish that the formaldehyde emission limit is being achieved at the same time the NOx limit is being achieved. However, as discussed in the response to comment VI.B.2, the final rule does not allow continuous compliance to be demonstrated by meeting low NOx emission levels required by a federally enforceable permit, so this comment is moot.

VI.B.4 Comment: One commenter (502) said that EPA should allow facilities to use existing test data to demonstrate compliance with the emission limitation if the test was conducted using the same methods specified in the rule and no process changes have been made since the test, or it can be demonstrated that the results of the performance test reliably demonstrate compliance despite process changes. The commenter recommended that EPA

revise the proposed 40 CFR § 63.6110 by adding the following paragraph:

> "An owner or operator is not required to conduct a performance test to determine outlet formaldehyde concentration on units for which a performance test was previously conducted for determining compliance with a regulation promulgated by the EPA and the test was conducted using the same methods specified in this subpart and either no process or equipment changes have been made since the test, or the owner or operator can demonstrate that the results of the performance test, with or without adjustments, reliably demonstrate compliance despite process or equipment changes."

Response: Since there are no emission limitation requirements for existing sources in the final rule, EPA expects that few facilities will have existing test data to demonstrate compliance with. Facilities that came online after the proposal would be the only sources that may have conducted emissions testing prior to the stack testing requirements of the final rule and EPA will allow facilities to use existing test data to demonstrate initial compliance with the emission limitation if the data is of good quality and is no older than two years. The facility must petition the Administrator for approval, and demonstrate that the tests were conducted using the same test methods specified in the subpart, the test method procedures were correctly followed, no process or equipment changes have been made since the test, and the data is of good quality and is less than two years old. Existing test data can only be used to demonstrate initial compliance; after the initial compliance demonstration, facilities must then begin to follow the annual compliance test schedule.

VI.B.5 Comment: One commenter (502) requested that EPA allow a facility with identical CTs to conduct performance tests on only one of the units to demonstrate compliance with the emission limits for all of the identical units.

Response: The EPA does not agree that it is appropriate to allow a facility with identical CTs to conduct performance tests on only one of the units to demonstrate compliance with the emission limits for all of the identical units. It is our experience that emissions from identical units can vary significantly.

VI.B.6 Comment: One commenter (437) recommended that the initial performance test period for demonstration of CO reductions be increased from 4 to 24 hours or longer to obtain results representative of the normal duty cycle.

Response: The EPA does not agree with this comment; it is believed that 4 hours is sufficient time to conduct the initial performance test.

VI.B.7 Comment: One commenter (483) advised EPA to consider an exemption from further MACT performance testing for oxidation catalyst equipped lean premix turbine combined cycle units.

Response: The EPA does not agree that there should be an exemption from further

MACT performance testing for lean premix turbine combined cycle units equipped with oxidation catalyst control. Subsequent performance testing is necessary to demonstrate that the emission limitations continue to be met.

VI.B.8 Comment: One commenter (443) did not support EPA's suggestion that if it required compliance with the formaldehyde limit and not a percent reduction of formaldehyde it might require "more frequent emission testing" (alternative to CO CEMS).

Response: The commenter did not identify the frequency of testing that they do not support. Thus, EPA is not able to respond to this comment.

C. Other

VI.C.1 Comment: One commenter (486) requested that the rule clarify that LPC CTs with oxidation catalysts will not be required to use CEMS. The rule should also clarify if CO CEMS for DFC units is an alternative or if it is always required. The commenter noted that all the utility size CTs constructed in Massachusetts over the last several years are LPC units and incorporate CO catalysts.

Response: As discussed in the response to comment VI.A.1, CO CEMS are not required in the final rule. Thus, the clarifications requested by the commenter are not necessary.

VI.C.2 Comment: Eight commenters (433, 443, 447/448, 471, 475, 483, 486, 505) recommended that CTs equipped with oxidation catalysts be given the option to meet the formaldehyde emission limitation. Commenter 471 said that requiring CO CEMS for units with oxidation catalysts places an unfair additional burden on those facilities that are among the best controlled and have the lowest emissions. Commenter 483 contended that LPC, combined cycle units with selective catalytic reduction (SCR) and oxidation catalyst systems should be recognized as cleaner, and the final rule should be amended to not conflict with new source review (NSR) permit monitoring requirements. The commenter recommended that EPA not require additional monitoring before the control units. If unit's initial test is below the 43 ppbvd limit, continuous compliance could be assured through continuing to meet the permitted CO or NO_x limit after the catalyst unit. Commenter 486 had a similar comment for LPC units equipped with oxidation catalysts.

Commenter 475 recommended that EPA provide the option to demonstrate compliance with the formaldehyde emission limit based on a one-time performance test conducted at the inlet to the oxidation catalyst. Commenter 443 proposed that EPA allow units installing catalysts to make a demonstration of compliance with the formaldehyde limit through periodic formaldehyde tests performed at the stack (annual testing should be more than sufficient). Commenter 433 stated that testing for formaldehyde emissions should be required even when an oxidation catalyst system is present, especially for larger CTs (greater than 10 or 50 MW).

Response: These commenters all were concerned that CTs equipped with oxidation

catalyst control were restricted to meeting the CO reduction limitation and installing CO CEMS. The commenters felt that these turbines should be given the option to meet the formaldehyde limitation. As discussed in the response to comment VI.A.1, the CO reduction emission limitation and CO CEMS requirement has been dropped from the final rule and turbines equipped with oxidation catalyst control can meet a formaldehyde emission limitation. Thus the concerns expressed by the commenters have been adequately addressed.

VI.C.3 Comment: Four commenters (420, 443, 444, 475) endorsed EPA's proposal to allow LPC CTs to rely upon low NO_x levels to demonstrate continuous compliance following initial testing. Commenter 444 requested that it be extended to all types of turbines that have low NO_x levels permitted by an enforcement agency. Two of the commenters (443, 475) recommended that EPA establish a minimum NO_x emission limitation of 15 ppm. There would be no requirements for additional emission testing or monitoring to demonstrate MACT compliance if a given LPC CT is operating at or below 15 ppm NO_x concentration in the exhaust gas stream.

Response: The EPA acknowledges the support expressed by the commenters. However, as discussed in the response to comment VI.B.2, comments received during the comment period led us to establish requirements for annual stack testing and continuous parametric monitoring in the final rule. The option to rely upon low NOx levels is not in the final rule.

VI.C.4 Comment: Two commenters (465, 470) stated that CO is likely a more reliable indicator of HAP emissions than NO_x since NO_x formation is inversely related to the emission of CO and HAPs. A protocol needs to be developed on how to correlate the formaldehyde emission rate with the surrogate emission rate. One commenter (470) said that EPA should use CO emissions as a surrogate for formaldehyde for LPC units. Likewise, two commenters (420, 430) recommended that EPA allow testing and monitoring of a surrogate for formaldehyde, such as VOCs or CO.

Response: As discussed in the response to comment VI.A.1, there are difficulties in measuring CO at the outlet of combustion turbines equipped with oxidation catalyst control. Therefore, using a surrogate CO emission rate is not a viable option. The commenter did not provide any supporting data to indicate a surrogate relationship between VOC and HAP, thus, EPA is unable to address their comment.

VI.C.5 Comment: One commenter (429) expressed the view that a combination of periodic Method 320 measurements and frequent or continuous surrogate measurements would give a high level of confidence to the actual performance and HAP emissions at a low cost. Initial emission measurements and periodic (every 3-5 years) should be conducted and can provide a calibration of the CO surrogate to the actual aldehyde level to facilitate monitoring in the interim periods between Method 320 tests. Another option is FTIR CEMS, however, the commenter believes CT emissions can be adequately monitored by periodic Method 320 testing with Method 320 calibrated CO surrogate measurements in between formal emission tests.

Response: As discussed in the response to comment VI.A.1, the option to use CO as a surrogate has been removed from the final rule, therefore, some of the comments expressed are moot. The EPA agrees with the commenter that periodic Method 320 measurements are appropriate for formaldehyde and that method is being required in the final rule.

VI.C.6 Comment: Two commenters (435, 502) requested that the proposed rule provide that emissions from CTs are to be determined on a net basis, subtracting ambient formaldehyde. One commenter (424) suggested that sources should balance measurement of trace emissions (aldehydes, HC, CO) by also measuring ambient or background levels. Similarly, one commenter (423) recommended that EPA provide an option to allow simultaneous testing of exhaust gases and incoming air. Those who fail the stack test due to high ambient formaldehyde in the bypass air could normalize the emission test by testing intake air as well. An additional standard could be based on the difference in measured formaldehyde between exhaust and intake air. A differential formaldehyde option would need to be placed in several locations in the final rule, including Tables 1, 3, and 4. Suggested language is given in the comment. Commenter 423 cited a study of ambient air in St. Louis that showed formaldehyde levels that would exceed the proposed 43 ppb emission limit as rationale.

Response: The EPA does not believe that ambient formaldehyde will have a significant effect on stack levels of formaldehyde, due to the extremely high combustion temperatures of CTs, which results in the formaldehyde being destroyed in the combustion air.

VI.C.7 Comment: One commenter (420) requested that in addition to proposed requirements for CEMS for CO and performance testing, EPA should include alternatives for monitoring utilizing protocols developed based on EPA's final CAM rule.

Response: As discussed in the response to comment VI.A.1, the final rule does not have a requirement for CO CEMS and CO performance testing due to public comments indicating that the CO stack testing methods and CO CEMS could not measure the low CO levels that are achieved particularly by LPC units with oxidation catalyst controls. Therefore, the comment is moot.

VI.C.8 Comment: One commenter (443) said that EPA should not require petitions for additional operating parameters.

Response: The EPA does not agree with the commenter. The petitions for additional operating parameters are intended for HAP control systems that have not been demonstrated yet. The response to comment V.D.10 provides detailed rationale supporting the requirement to petition for additional operating parameters.

VI.C.9 Comment: One commenter (502) recommended that the wording of § 63.6120(f) should be changed to ensure that some new, arbitrary formaldehyde limit would not be imposed. For example, the following words could be added to (f): "to assure that the formaldehyde emission limit of 43 ppb will be met."

One commenter (417) suggested that the wording of § 63.6120(f) should be modified from ". . . additional operating limitations to be established during the initial performance test and continuously monitored thereafter" to "operating limits to demonstrate compliance with the formaldehyde emission concentration limitation during the initial performance test and continuously monitored thereafter."

Response: The EPA is amenable to clarifying the wording of § 63.6120(f) to make it clear that the operating limits are for the formaldehyde limit in the rule. The EPA has incorporated these suggestions in the final rule by adding clarifying language to § 63.6120(f).

VI.C.10 Comment: One commenter (417) said that the wording of § 63.6120(f) should be revised from " . . . your stationary combustion turbine is not diffusion flame or lean premix, you must petition the Administrator . . ." to read " . . . the stationary combustion model is not diffusion flame or lean premix, the manufacturer must petition the Administrator . . . ." The rationale for the change is that this only needs to be done once for each model.

Response: The EPA does not agree with the commenter that this should only be done once for each model. The option to petition the Administrator should be utilized on a site-specific basis, not for an entire model line of a turbine.

VI.C.11 Comment: One commenter (417) recommended that the wording of § 63.6120(g)(3) be revised to read "The limits proposed for the model turbine with a discussion of how these limits were developed and why the applicant feels they will assure compliance with the limitations. If data is not available to determine the limitations at the time the petition is submitted, the petition must include a discussion of how you will establish the upper and/or lower values for the parameters which will be establish the limits on these parameters in the operating limitations:"

Response: The EPA does not agree that this change is necessary. The EPA feels that the language in the section is adequate as written.

VI.C.12 Comment: One commenter (417) recommended that in § 63.6120(h)(7), EPA should change ". . . infeasible or unreasonable. . . " to ". . . infeasible, unreasonable or unnecessary. . . "

Response: The EPA has accepted the commenter's recommendation and made this change to § 63.6120(h)(7).

VI.C.13 Comment: One commenter (417) requested that EPA change the title of Table 6 to read "Other than Diffusion flame or Lean Pre-mix" and also change the table to reflect that if the Administrator concurs that § 63.6120(h) applies, no monitoring is required.

Response: As a result of new information received since proposal, the requirements in Table 6 no longer apply only for turbines that are not DFC or LPC. Thus, the comment is moot.

VI.C.14 Comment: One commenter (502) contended that the requirement that deviations must be accounted for in addition to exceedances is overly burdensome (§ 63.6150(d)(4)). Reporting should only require identification of start, stop, and malfunction periods.

Response: The requirements in § 63.6150(d)(4) were for CTs using CEMS to comply with an emission limitation. The requirement to use CEMS has been removed in the final rule, thus this comment is moot.

VI.C.15 Comment: One commenter (437) asked that EPA clarify in § 63.6150(a) that only those units subject to an emission limitation must comply with the reporting requirements.

Response: The EPA agrees with the commenter that the rule should clarify which units must comply with reporting requirements. This has been clarified in the final rule.

VII. TEST METHODS

A. Formaldehyde

1. CARB 430

VII.A.1.1 Comment: Four commenters (412, 421, 436, 449) urged EPA to re-review all emission tests using CARB 430. Commenter 412 noted that CARB had issued an advisory about the use of CARB 430. Commenter 449 stated that any historical data from DFC units using this method should be considered suspect, including data from the CT Emissions Database and AP-42 emission factors. Unless proven otherwise, the DFC CT test data should be designated "non-quantitative" based on the Method 430 advisory from CARB. Commenter 436 said that a study of the accuracy and precision of CARB 430 at low ppb levels is needed to determine the significance of the test data on which the standard is based.

Response: The EPA reviewed the CARB advisory issued on April 28, 2000 and additional background material in the GRI Topical Report entitled "Investigation of Interferences with Aqueous 2,4-DNPH Based Methods for Measurement of Aldehydes in Natural Gas Combustion Exhaust" submitted by Commenter 449. As a result of comments received during the comment period, EPA performed an extensive review of tests used at proposal and new tests received during the comment period. A screening analysis of the formaldehyde test data for diffusion flame combustor turbines was conducted. Tests conducted using CARB 430 were evaluated due to the CARB advisory, which stated that formaldehyde data measured by CARB 430 where the NOx emissions were greater than 50 ppm should be flagged as non-quantitative. Tests where the NOx emissions were greater than 50 ppm or tests where the NOx levels were unknown were excluded from EPA's analysis.

EPA further analyzed and reviewed the remaining test reports to ensure the methods were used correctly in calculating and reporting formaldehyde concentrations and to check that proper QA/QC procedures were followed. A number of errors were found in the test reports where CARB 430 was used to quantify formaldehyde concentrations. In several instances the CARB 430 reporting protocol was not followed. If the concentration is less than five times the field blank, CARB 430 uses five times the field blank as the reported result to correct for interferences or contaminants that can react with the formaldehyde or dinitrophenylhydrazine to yield negative bias. However, many test reports did not report formaldehyde concentrations in this fashion. EPA therefore recalculated the formaldehyde concentrations where the CARB 430 reporting protocol was not followed correctly.

VII.A.1.2 Comment: Nine commenters (424, 430, 435, 436, 442, 449, 460, 479, 502) expressed concerns regarding the accuracy and precision at levels commensurate with the proposed standard. Two of the commenters (424, 479) noted that CARB 430 is susceptible to interferences. One commenter (436) said that sample loss and measurement uncertainties can contribute to large measurement variability. One commenter (449) asserted that CARB 430 should not be included as an appropriate method for DFC CTs.

One commenter (429) contended that CARB 430 is an indirect measurement method and is inferior to Method 320. CARB 430 cannot give realistic results due to the following: formaldehyde results tend to be negatively biased with high scatter, especially at low concentrations; there are other problems with high field and analyte blanks; the tester must know the NO_2 concentration prior to testing, introducing another uncertainty into the measurement; the method can give false acetaldehyde detections; data cited showing inconsistencies with CARB 430; and the high level of variations and biases observed may lead to future compliance problems or public lawsuits over falsely detected species or negative catalyst performance.

Two commenters (485, 501) observed that the minimum detection limits are higher than the MACT Floor. Standard procedures for handling blank corrections and non-detects should be added to the promulgated test methods. The method should be validated for combustion sources and revised to provide for longer sampling runs necessary to achieve the detection levels needed to reliably and routinely measure ppb level formaldehyde. Longer sample runs are problematic.

Two commenters (435, 437) recommended modifications to CARB 430 and guidelines to enhance the measurement reliability for CARB 430. Commenter 435 stated that with the modifications, CARB 430 can achieve a detection level less than 43 ppb. Similarly, commenter 437 said that the use of CARB 430 is conditionally supported, but additional guidance and deviations from the method as currently published should be provided. Field validation of the method performance for CT applications according to EPA Method 301 is recommended. That commenter also recommended that EPA should require use of paired sampling trains for every test run. If the precision of any one test run with paired sampling trains is poor due to apparent random contamination, it should be explicitly permitted to disregard the suspect sample results.

One commenter (435) recommended that the CARB 430 reporting protocol be revised to

reflect the actual emissions from the CT. The rule should indicate that when using CARB 430 to demonstrate compliance with the proposed standard, the reporting criteria should not be as indicated in CARB 430 but should be the stack measurement minus the average field blank measurement. Conversely, one commenter (437) recommended that EPA should retain the CARB 430 reporting limit procedures, or a valid statistical measure of uncertainty such as the 95 percent upper confidence bound, to reflect data quality. Since the method was developed for much higher in-stack formaldehyde concentrations, and hence much higher blank contamination levels, EPA should develop an alternative calculation procedure to account for increased likelihood of very low-level blank contamination.

Response: The EPA agrees with the nine commenters' concerns regarding the accuracy of CARB 430 levels commensurate with the proposed standard. EPA agrees with the commenters who noted that CARB 430 is susceptible to interferences or who said that sample loss and measurement uncertainties contribute to large measurement variability. EPA agrees with Commenter 429 that the method is an indirect measurement method, however, EPA disagrees that CARB 430 cannot give realistic results; in some cases EPA believes that CARB 430 can provide realistic data. However, EPA also agrees that Method 320 would be the better compliance method. Therefore EPA has specified Method 320 as the compliance procedure.

VII.A.1.3 Comment: One commenter (443) remarked that EPA does not explain how it calculated the 2-3 ppb detection limit cited in the preamble for CARB 430; EPA should explain the procedure used to calculate the detection limit and to review the calculation results. The commenter also said that EPA's method for determining the detection limit of CARB 430 significantly overstates the practical source measurement capabilities of this method.

Response: The EPA used reported responses from low level standards or blanks to calculate standard deviation of the responses and then multiplied that by three to estimate a detection limit potentially attainable.

VII.A.1.4 Comment: One commenter (443) expressed the view that ambient formaldehyde may affect CARB 430 test results. The commenter requested that EPA conduct ambient tests and develop ways to correct for ambient contributions/contamination in the results. The EPA should design its standard and compliance methods to ensure that sources' compliance status is not susceptible to fluctuations in ambient formaldehyde concentrations.

Response: The EPA agrees that ambient formaldehyde may affect CARB 430 results; Method 320 results will be less affected. However, since Method 320 is the only test method allowed in the final rule to demonstrate compliance, this comment is moot.

2. FTIR/EPA Method 320

VII.A.2.1 Comment: Nine commenters (420, 424, 435, 436, 443, 449, 460, 479, 502) expressed concerns regarding the accuracy, precision, and reliability at levels commensurate with the proposed standard. Three commenters (435, 460, 502) said that the method is not

acceptable for demonstrating compliance without extensive modifications. One commenter (502) noted that there is little, if any, FTIR data at low ppb levels. One commenter (443) stated that the method's lenient performance specifications allow significant measurement error in reportable results. One commenter (420) noted that FTIR testing is only offered by a limited number of providers, requires special expertise and significant capital investment, and is still a relatively immature field of endeavor. One commenter (424) said that many stakeholders are not supportive of FTIR because of the attendant costs, sensitivity and interference problems, and need for considerable operator expertise.

Two commenters (443, 479) noted that the method is susceptible to interferences from water vapor, NO_2, and hydrocarbons. Likewise, one commenter (436) said the method is susceptible to interferences from water vapor and carbon dioxide, and the method cannot be the preferred measurement technique without a field demonstration of the feasibility of measuring formaldehyde at low ppb in LPC exhaust.

One commenter (479) said that an instrument with a pathlength of 200 meters (m) would be needed (possible but would have to be set up at an off-site facility). Samples would have to be transported for sampling very quickly. Contamination of samples during transport is also a concern. One commenter (443) contended that there are not enough testing companies with instruments of sufficient path length to measure at that low levels. The commenter estimated that path lengths higher than 100 to 125 m will be needed. The commenter is aware of only two FTIRs equipped with a 100-125 m path length cell and neither have been tested and validated in the field for compliance testing purposes. The commenter said that EPA has not provided any data to assess what effect the extended path length required for low level formaldehyde measurement will have on instrument precision, accuracy, signal strength, or potential interferences.

One commenter (443) stated that the method's minimum detection limit is too high to provide any confidence in measurements at the 43 ppb level. The FTIRs currently being used to some degree in the field with modified procedures have formaldehyde detection limits of approximately 50-60 ppb. One commenter (449) expressed support for the use of extractive FTIR but had reservations about EPA's statement that the method is capable of achieving below 43 ppb. The commenter believed that this level of detection is not achievable in practice and that EPA should consider that the test method must be achievable in practice by professionals with a level of expertise, and a required capital investment, commensurate with the current standards in the emission source test community.

Two commenters (485, 501) stated that FTIR can achieve the detection limits necessary to quantify sub-ppm formaldehyde emissions, but at high costs and only with pre-concentrating measures to remove water vapor and/or CO_2, specialized equipment (long path length) and extremely rigorous quantitative analysis. The FTIR test method must be revised to incorporate approved methods and procedures for selecting path length, pre-concentrating emissions or otherwise reducing routinely achievable detection levels.

One commenter (437) expressed conditional support for the use of FTIR but said that additional field studies are needed to demonstrate minimum detection limits and practical quantitation limits. Field validation of the method performance for CT applications according to EPA Method 301 is recommended.

Response: The FTIR technology is rapidly improving and this trend will continue. As a result, EPA received a divergence of opinions reflecting this rapidly changing trend. Method 320 is a self-validated performance-based method that will allow the use of this improved technology and not suppress it. Current state-of-the-art methodology can identify and measure formaldehyde concentrations well below the current emission limitation with a path length of 10 meters or less. Some of the older technology may require 100 or even 200 meter path length. The method has a pretest preparation and evaluation procedure to determine the optimum sampling system configuration for measuring formaldehyde customized to the technology the tester is using. Detection levels in FTIRs are limited either by noise or by interference from other gases. Measurement of formaldehyde has very little interference so one can get close to the noise limited detection with state-of-the-art technology. EPA agrees with Commenter 443 that some of the performance criteria may be more lenient than needed by current state-of-the-art technology, but it is sufficient. The cost to conduct a test is not the primary concern of EPA, however, as indicated by Commenter 429, the cost appears to be decreasing, as would be expected in the free market system. Water vapor (and other) interferences are taken into consideration in the pretest planning.

VII.A.2.2 Comment: One commenter (429) expressed the view that Method 320 is the most accurate, precise, and cost effective method for formaldehyde measurements. It does not have the physical or chemical limitations of the other formaldehyde methods. The commenter said that in 1998, FTIR detection limits of 10 ppbv were obtained with a 80 meter pathlength cell. With subsequent advances in instrumentation hardware and software, 8 ppbv with a 10 meter pathlength cell is now achievable and demonstrated in the field. Recent field data shows further improvement of the detection limit to 6 ppb. An eventual reduction of detection limit to near the 3 ppbv theoretical limit obtainable with current instrumentation at 10 meters pathlength is foreseen. It is possible to achieve this over a 1-hour measurement period.

According to the commenter, the current cost of Method 320 measurements is extremely competitive to that of other methods. Data were cited that shows that for two turbines, the cost for testing is virtually identical to that for other methods. At three turbines and more, the Method 320 per turbine cost drops below that of the other methods. The cost for one turbine test on-site is $11,765.

The commenter also said that Method 320 requires a few changes to optimize its usage for turbine measurements. They are as follows: Method 320 should be a performance-based method; “tweaking” Method 320 will not have any effect on detection limits; Method 320 should be classified as a “stand alone” method in a MACT rule instead of promulgating other inferior methods as alternates; Method 320 should not require revealing of spectral analysis details, reference spectra or sample spectra.

One commenter (437) recommended that in addition to the formaldehyde spike procedure and recovery criteria already contained in EPA Method 320, the absence of significant sampling system bias be demonstrated by injecting ultra-high purity nitrogen calibration gas at a flow rate exceeding total sampling flow rate at two locations in the sampling system. One location is directly at the inlet of the FTIR sampling cell, and the other is at the back of the sampling probe as close to the probe as practical but upstream of any sample conditioning (e.g., heated filters). The total absolute difference in measured formaldehyde concentrations at these two locations (defined as sampling system bias) should be less than 10 percent of the formaldehyde concentration limit, otherwise corrective action to the sampling system must be implemented.

Response: The EPA appreciates the suggestions for improving Method 320 and will consider these as well as any others during periodic reviews. However, the improvement suggestions do not appear to be in the critical path of the standard-setting process.

3. EPA SW-846 Method 0011

VII.A.3.1 Comment: One commenter (437) did not support the use of EPA Method 0011 for turbines because: there is no need for isokinetic sampling in CT stacks; compared to CARB 430, the field procedure is more complex, the potential for chronic field contamination is much greater, the QA/QC procedures are vastly inferior, and the data reporting procedures especially with respect to blanks are more vague; and the method does not have sufficient sensitivity for demonstrating compliance with the proposed formaldehyde limit. One commenter (449) remarked that the method should be excluded from the list of acceptable test methods because it uses a similar analytical approach to CARB 430, has not been validated for application to CTs, and has QA requirements considered less than CARB 430. Commenter 443 also noted that this method is similar to CARB 430 and thus will present similar measurement issues.

Six commenters (435, 437, 460, 485, 501, 502) noted that the method states that detection limit may be as low as 90 ppb; therefore method does not have demonstrated capability for 43 ppb limit. One commenter (429) said that the method is inferior to EPA Method 320.

Two commenters (485, 501) recommended that the method should be validated for combustion sources and revised to provide for longer sampling runs necessary to achieve the detection levels needed to reliably and routinely measure ppb level formaldehyde. Longer sample runs are problematic. Standard procedures for handling blank corrections and non-detects should be added to the promulgated test methods. More stringent QA/QC measures are needed.

Response: The EPA agrees with the commenters that the method has many shortcomings and limited application opportunities for use in measuring formaldehyde emissions from combustion turbines. Accordingly, EPA is not including EPA Method 0011 in the final rule. Both EPA Method 0011 and CARB 430 can be requested on a case-by-case basis as part of EPA's alternative method review process.

4. EPA Method 323

VII.A.4.1 Comment: Nine commenters (435, 437, 442, 443, 449, 460, 485, 501, 502) said that EPA Method 323 should not be used for measuring very low concentrations of formaldehyde. The minimum detection levels of the method are not suitable for the emission standard. One commenter (443) noted that the method could not be modified to measure such low concentrations without significantly affecting its accuracy and precision and calling into question the entire validity of the method. Two commenters (435, 502) also noted that the method has not been validated or demonstrated for use on CTs with low ppb range formaldehyde emissions. One commenter (420) also noted that the method is difficult and costly.

One commenter (429) stated that Method 323 is inferior to Method 320. In the commenter's opinion, total water soluble aldehyde methods such as Method 323 are not useful, especially when attempting to calculate total aldehyde emissions. Formaldehyde cannot be differentiated from acetaldehyde, etc. which prevents accurate calculation of total mass of HAPs emitted from the source measured. The commenter has also observed formaldehyde positive biases as high as 300 percent with Method 323 in natural gas-fired combustion sources as compared to Method 320. The high level of variations and biases observed may lead to future compliance problems or public lawsuits over falsely detected species or negative catalyst performance.

Response: The EPA agrees with the commenters that EPA Method 323 should not be used for measuring low concentrations of formaldehyde from combustion turbines and has therefore not included it in the final rule.

VII.A.4.2 Comment: One commenter (440) requested that EPA include an option to add a cooling coil to the formaldehyde test apparatus. The concern is that CT exhaust will melt the Teflon tubing on the proposed apparatus.

Response: The EPA agrees with the commenter that melting Teflon is a concern.

VII.A.4.3 Comment: One commenter (515) recommended that the proposed Method 323 be clarified to indicate the sampling time required per run.

Response: The EPA agrees that minimum sampling time should have been specified. However, in the final rule EPA is not allowing Method 323 for demonstrating compliance.

5. Other

VII.A.5.1 Comment: Four commenters (420, 437, 442, 449) requested that the final rule allow ASTM Method D6348 as equivalent to Method 320.

Response: The EPA is working with ASTM to make a few changes to ASTM D 6348-

98. Upon successful ASTM balloting of these changes, EPA will reconsider.

VII.A.5.2 Comment: One commenter (449) said that EPA Method 316 may be a viable formaldehyde test method for CTs. The final rule should include provisions to use other approved methods, and to incorporate new methods for formaldehyde measurement as they are developed.

Response: The EPA agrees that EPA Method 316 may be an acceptable alternative in limited cases, provided it is modified to prevent a potential negative SO_2 interference as described in the literature. However, additional study and validation would be needed. If there is interest, EPA would be willing to work with interested users to develop an acceptable validation plan.

VII.A.5.3 Comment: One commenter (385) informed EPA that three ASTM standards have been updated: E 337-84 (1996) is now E 337-02; D 3154-91 is now D 3154-00; and D 5835-95 is now D 5835-95 (2001).

Response: The EPA appreciates the comment; however, these particular ASTM standards are not referenced in the preamble to the final rule, therefore, it was not necessary to update the standards..

VII.A.5.4 Comment: Nine commenters (418, 421, 435, 443, 444, 449, 481, 502, 519) remarked that there is a lack of repeatable and reliable formaldehyde test methodology that is capable of detection at low levels. Commenter 443 observed that assuming a realistic detection limit of 50 ppb for several of the methods, EPA would need to set the standard at 250 ppb or higher (5 x DL) to ensure that measurement issues would not lead to a significant number of failures. Commenter 443 also suggested that EPA should give additional consideration to its determination of the MDLs for the proposed methods when it establishes the final formaldehyde emission limit. Furthermore, given the uncertainty in the methods, EPA must provide sources the opportunity to perform additional tests before a required "performance test" would be deemed failed. Also, EPA must ensure in the final rule that no source could be required to use one of the methods to conduct performance testing.

Commenter 421 questioned the validity of EPA Method 0011, CARB 430, and EPA Method 320 or FTIR for measuring extremely low levels of formaldehyde emissions. Commenter 444 said that EPA should reevaluate the data on which the proposed standard is based and whether or not a formaldehyde level that may be set in the final rule can be reliably measured.

Response: The EPA agrees with the commenters that EPA Method 0011 and CARB 430 may not be valid for measuring extremely low levels of formaldehyde emissions. Therefore some of the comments are moot. The EPA does not agree that EPA Method 320 should not be used. Several EPA Method 320/FTIR experts were consulted and they indicated that detection limits as low as 10 ppb were possible. The EPA agrees that the data on which the proposed

standard should be reevaluated. An extensive review of the data was conducted. This review is discussed in great detail in the response to comment V.A.1.

VII.A.5.5 Comment: Two commenters (435, 460) said that there are several ambient methods available for measurement of formaldehyde, but the matrix of turbine combustion gases makes these methods unsuitable for consideration as valid procedures to document compliance with CT emissions limits.

Response: The EPA acknowledges the comment.

VII.A.5.6 Comment: One commenter (424) recommended that a joint industry-government task force for the measurement of aldehydes from gas turbine exhaust be formed.

Response: The EPA would be willing to participate in the task force.

VII.A.5.7 Comment: One commenter (424) contended that CEMS requirements cannot be supported by the current formaldehyde monitoring technology. Formaldehyde testing should be performed on a periodic (annual) basis or replaced by surrogate CO measurement practices.

Response: The rule does not have a CEMS requirement for monitoring formaldehyde.

VII.A.5.8 Comment: One commenter (463) submitted a test report that compared FTIR and CARB 430. The testing was conducted on a Siemens Westinghouse 501F gas-fired CT with LPC, SCR, and CO catalyst. Formaldehyde was measured using CARB 430 and FTIR. The CARB 430 results did not compare well with the FTIR results. The formaldehyde emissions using CARB 430 averaged 9 ppb in the turbine exhaust and 5 ppb at the stack. The FTIR results were 47 ppb at the turbine exhaust and 42 ppb at the stack.

Response: The EPA thanks the commenter for submitting the information. The EPA agrees that CARB 430 understates the formaldehyde concentration in the exhaust gas from stationary CTs.

B. CO

1. CEMS

VII.B.1.1 Comment: Twenty-three commenters (421, 422, 424, 426, 427, 430, 435, 436, 437, 442, 443, 444, 447/448, 449, 460, 479, 482, 485, 486, 501, 502, 508, 509) said that CO CEMS cannot reliably measure trace level CO concentrations and 95 percent CO reduction. Commenter 449 remarked that EPA provides no information to show that CEMS are available to accurately measure low CO concentrations, and the use of CO CEMS for low CO levels is well beyond the scope of current 40 CFR 60 CEMS standards. Revisions will be needed to the standards. Also, vendor claims for CO CEMS and CO instrumental analyzers, unless accompanied by emissions test data obtained under known and controlled conditions applicable

to the subject source type, should not be considered adequate proof of availability and performance.

Two commenters (485, 501) observed that in cases where CO is very low, specifications for calibration drift and relative accuracy set out in PS-4A may be unattainable; for a trace-level CO analyzer, alternatives to PS-4A may be necessary. One commenter (505) recommended that PS 4 and 4A should be revised to reflect the measurement of CO in the range of 0-10 ppm and 0-1 ppm and also should be harmonized with 40 CFR Part 75 CEMS requirements. Methods for determining the relative accuracy of the CEMS should be developed with the low CO ppm measurement in mind.

Response: The EPA agrees that existing CO CEMS technology and EPA performance criteria are not adequate to reliably and accurately measure trace levels of CO. The ASTM is currently trying to address this issue and EPA is participating.

VII.B.1.2 Comment: One commenter (486) suggested that EPA allow data validation to be performed in accordance with 40 CFR § 75.10(d) provisions as an alternative to the two quadrant methodology specified in § 63.6125(a)(3). The commenter noted that Subparts Da and Db of 40 CFR part 60 allow use of 40 CFR part 75 data validation procedures as an alternative to application of part 60 procedures.

Response: The use of current 40 CFR Part 75 data validation would not be suitable for this Part 63 application. However, CO CEMS are not being required so the suggestion is moot.

VII.B.1.3 Comment: One commenter (419) requested that the 40 CFR part 60 Appendix B, Specification 2 requirements regarding measurement range should be waived, and perhaps even the RATA requirements.

Response: Carbon monoxide CEMS are not being required so the suggestion is moot.

VII.B.1.4 Comment: One commenter (484) recommended that EPA revise the CO CEMS requirement to extend the averaging time and utilize O_2 or CO_2 measurements at only the outlet of the oxidation catalyst.

Response: Based on this comment and other similar comments received during the public comment period, EPA has decided that the CO CEMS systems are not accurate enough to measure the outlet CO concentrations of lean premix combustor turbines with oxidation catalyst systems, which are expected to comprise most of the affected sources. Therefore EPA has decided to not use CO CEMS units for monitoring or compliance and a reply to the comments are moot. However, EPA believes that the 4 hour rolling average is appropriate for combustion turbines burning natural gas and number 2 distillate oil since the fuel composition does not vary significantly. Regarding the comment on measurement of O_2/CO_2 only at the outlet rather than at the inlet and outlet presumably for indexing purposes, that comment is also moot now but since the O_2/CO_2 concentration will change only slightly going across the catalyst, one

measurement at the outlet could have been used to index both the inlet and outlet concentrations.

VII.B.1.5 Comment: One commenter (443) remarked that the absence of any specific proposals for revision of PS 4A, Method 10, and Procedure 1 of Appendix F, or any data upon which to develop suggestions for revision, make it impossible to comment on necessary revisions. EPA must promulgate some alternative that does not require use of CO CEMS.

Response: Based on this comment and other similar comments received during the public comment period, EPA has decided that the CO CEMS systems are not accurate enough to measure the outlet CO concentrations of lean premix combustor turbines with oxidation catalyst systems, which are expected to comprise most of the affected sources. Therefore EPA has decided to not use CO CEMS units for monitoring or compliance. Consequently, the comment regarding the use of PS 4A, Method 10, and Procedure 1 of Appendix 1 as they were to be used to support the CO CEMS are moot. However, EPA still plans to revise PS 4, Method 10, and Procedure I of Appendix A to improve their accuracy.

VII.B.1.6 Comment: One commenter (485) requested that EPA eliminate the annual RATA requirement for CO CEMS for the Alaska North Slope.

Response: Stationary turbines located north of the Arctic Circle (and therefore the Alaska North Slope) are not being required to install and operate CO CEMS in the final rule, so the suggestion is moot.

VII.B.1.7 Comment: One commenter (419) suggested that the CO range should be set to accurately indicate CO breakthrough rather than continuous measurement.

Response: The EPA understands the commenters position, i.e., to intermittently measure CO levels and take action only when the CO levels are high, indicating CO catalyst breakthrough, indicating that the catalyst system should be replaced. The EPA's preferred position is to use continuous pollutant emissions monitoring whenever the continuous monitoring system is proven to accurately measure the pollutant concentrations and the costs are reasonable. A continuous monitoring system more clearly indicates continuing compliance with the emission limitation, will instantaneously indicate if a process malfunction or control device malfunction is occurring, will result in a quicker response to malfunctions thereby reducing emissions during malfunction, and will clearly indicate when a pollutant breakthrough is occurring. Based on information received during public comments, EPA has decided not to use the CO CEMS and CO stack testing methods since the levels of CO expected to be emitted by CTs would be too low to be accurately measured. Therefore the final rule does not have a CO emission limitation and this comment is now moot.

VII.B.1.8 Comment: One commenter (430) recommended that for units complying with the MACT standard using an oxidation catalyst, the initial performance evaluation for removal efficiency of CO should take into account the operating conditions used by the catalyst vendor to

determine design removal efficiency.

Response: The commenter did not indicate how the operating conditions used by the catalyst vendor to determine design removal efficiency was to be obtained and used. Also the commenter did not indicate the relevance of this information to the compliance determination of the oxidation catalyst system. The EPA called the commenter to clarify the commenter's intent. The commenter intended that the EPA required removal efficiency should be consistent with the vendor's design and take into account operating load. An oxidation catalyst system is normally designed by the vendor based on information provided by the owner/operator, including load and other operating parameters and the removal efficiency. Therefore the owner/operator should already have knowledge of the load, design removal efficiency, and other parameters. Some commenters indicated that EPA should explicitly state in the regulation that testing at any load is allowed to avoid any confusion. The emission limitations established in the final rule were based on test results measured when the turbines were being operated at high loads (between 90 and 110 percent). Therefore EPA has indicated in the final rule that performance testing should be conducted at high load; alternatively, sources may choose to conduct testing at lower loads but failure to demonstrate compliance at less than high load is considered a deviation from the emission limitation.

VII.B.1.9. Comment: One commenter (419) noted that operating an upstream and downstream CEMS is complicated, even if you timeshare. The commenter questioned whether a dual range analyzer would be needed.

Response: Carbon monoxide CEMS are not being required so the suggestion is moot.

VII.B.1.10 Comment: One commenter (443) stated that measurement of CO directly at the outlet of any CT (whether simple or combined cycle) would be difficult because of the unrepresentative nature of the CT outlet sampling location. One commenter (430) said that for the inlet of an oxidation catalyst, sampling is physically and technologically difficult.

Two commenters (465, 470) expressed the view that existing monitoring methodology and technology should be able to accurately measure the CO emissions after control technology.

Response: The EPA agrees with the commenters. However, CO CEMS are not being required so the comments are moot.

2. EPA Method 10

VII.B.2.1 Comment: Two commenters (485, 501) observed that in cases where the uncontrolled exhaust CO is already very low, it will be difficult to show compliance with the 95 percent reduction standard based on Method 10 measurements

Response: The EPA agrees with the commenters. However, CO CEMS are not being required so the comments are moot.

VIII. COST/IMPACTS

VII.1 Comment: Four commenters (421, 479, 481, 482) said that EPA has substantially underestimated the cost of the proposed standard. Commenter 482 observed that several of the estimates used to calculate the impacts are not accurate. The following estimates are too low: only 20 percent of turbines will be located at major sources; only 5 percent of new turbines will have to install oxidation catalyst control; and only 10 existing lean premix turbines will have to install oxidation catalysts. Also, the assumption that turbines operate 8760 hours per year, used to calculate the emission reduction, is unrealistic. More realistic figures are 20 percent for simple cycle and 60 percent for combined cycle. Commenter 481 said that a more realistic figure for simple cycle is 30 percent. Commenter 479 said that actual 2002 capacity factors for their LPC turbines averaged about 4 percent. The capacity factors for their DFC turbines were even much lower. Approximately 80 percent of all gas-fired CTs currently in operation in the U.S. are operated at annual capacity factors of 10 percent or less. Approximately 65 percent of the CTs are operated at capacity factors of less than 6 percent per year.

Response: The EPA acknowledges that the costs of the proposed CT MACT standard could be higher than estimated. For example, the commenter took issue with the percentage of new LPC turbines that may have to put on controls to achieve the emission limitation. The information that was available to us at proposal was that only a small fraction of turbines (~5 percent) would find it necessary to install add-on controls. In actual practice possibly more owners/operators would choose to put on controls to assure that the emission limit would be met with a higher margin of safety. Since proposal, new information was obtained which indicates that some LPC turbines have oxidation catalyst systems installed, which establishes the MACT floor for new LPC turbines in the final rule to be the level of performance for a LPC turbine with an oxidation catalyst control system installed. Therefore for purposes of costing, all new turbines, both DFC turbines and LPC turbines, are assumed to have to install oxidation catalyst controls. Therefore the costs of complying with the final standards are not underestimated.

The EPA also agrees that 8,760 hours per year of operation is unrealistic to estimate HAP emissions and agrees with the commenters that stated that 20 percent average capacity factor for simple cycle turbines and 60 percent average capacity factor for combined cycle turbines are more realistic for estimating HAP emissions. The emission reductions are now based on those assumptions. Capacity factors of less than 4 percent to 6 percent were not felt to be representative of all combustion turbines.

The EPA believes that the estimate that only 20 percent of turbines will be located at major sources is the most accurate estimate that could be made based on the information the EPA has.

VII.2 Comment: Two commenters (424, 427) stated that EPA has significantly underestimated the impact on existing LPC turbines. Most existing LPC turbines will require a CO catalyst and CO CEMS because the proposed formaldehyde level is not representative.

Commenter 427 estimated that over 120 of their existing fleet of LPC CTs will be affected. Both commenters recommended that existing LPC CTs receive the same treatment as existing DFC, e.g. no control.

Response: As a result of comments, the MACT Floor for existing gas-fired and oil-fired LPC units was reevaluated and found to be no emission reduction. The final rule therefore does not require existing LPC units to meet an emission limitation, and these units will not be impacted by the rule. Thus, the concerns expressed by the commenters are moot.

VII.3 Comment: Two commenters (424, 427) expressed the view that most new LPC turbines will require a CO catalyst and CO CEMS (because the proposed formaldehyde level is not representative). The proposed rule will result in very minor reduction of HAP with significant expense.

Response: As discussed in the response to comment IV.B.1, EPA requested and received new emissions data for LPC units which led to further subcategorization by fuel and a revised formaldehyde emission limitation for gas-fired and oil-fired LPC turbines. The rule no longer requires units equipped with a CO catalyst to install a CO CEMS. Thus, this concern is moot. The EPA does not agree with the comment that the proposed formaldehyde level is not representative. It is believed that the data set is adequately representative and that the formaldehyde limit has been set correctly according to the requirements in the CAA.

VII.4 Comment: One commenter (446) questioned whether EPA has factored the disposal or regeneration of the spent catalyst into their Environmental, Energy, and Economic Impacts evaluation.

Response: The disposal or regeneration of the spent catalyst has not been factored into the Impacts evaluation. According to catalyst vendors, the catalyst can be washed and restored for ten years or more of continuous operation. Spent catalysts can be returned to the vendor for recycling or disposal. The owner/operator can receive credits toward a new catalyst for the return of the old one, in the form of cash, metal, or metal account.

IX. RISK

Note: All of the comments pertaining to risk are summarized below. There is a single response given at the end of this section for all of the risk comments.

IX.1 Comment: Commenter 484 recommended that EPA consider implementation of a risk-based approach to setting the MACT floor.

IX.2 Comment: Commenters 428 and 519 supported the use of risk-based applicability criteria to remove sources that do not pose significant risk.

Commenter 422 believes that EPA has an opportunity, in the CT rule, to significantly reduce the costs to the regulated community due to the low risks associated with emissions from

turbines.

IX.3 Comment: Commenter 502 stated that allowing the use of the section 112(d)(4) provision within the source category could provide substantial cost-effectiveness benefits while, at the same time, providing protection to human health and the environment. However, the commenter believes that EPA must clarify in the final rule exactly how the provisions will be implemented.

Commenter 502 believes that the risk-based approach is particularly viable for the CT source category. The commenter noted that because the authority Congress gave EPA to set risk-based standards during the MACT process in CAA section 112(d)(4) is limited to threshold HAP and some of the HAP emitted by the CT source category are non-threshold HAP, EPA will have to rely on both its authority under 112(d)(4) and its inherent *de minimis* authority to not regulate trivial matters that will not foster the goals of the statute, i.e., protecting public health and the environment.

IX.4 Comment: Commenter 476 believes that there are ways to structure the rule to focus on facilities that pose significant risks and avoid imposition of high costs on facilities that pose little risk. An appropriate approach would be to allow individual facilities to conduct a risk assessment to show that it poses insignificant risks to the public. Commenter 476 stated that such an approach would involve air quality modeling and the use of RfCs.

IX.5 Comment: Commenter 440 agreed with and adopted the rationales of the referenced AF&PA white papers, and believes that EPA has the legal and statutory authority to implement a risk-based approach in the final rule pursuant to CAA section 112(d)(4) and the Agency's inherent *de minimis* authority.

IX.6 Comment: Commenter 439 stated that, to the extent that risk-based mechanisms become available, they would consider their use in alleviating non-cost-effective controls on their stationary CTs. The commenter added that if risk-based options are not available or workable at a specific site, EPA should consider bubbling and emissions averaging. For the low-HAP emitting stationary CTs, especially where only one or two units exist and do not constitute a major source designation themselves, EPA should explicitly make available bubbling with other process unit controls.

IX.7 Comment: Commenter 431 believes that considering the very low emission rate for combustion turbines, it is appropriate for EPA to consider and implement a risk based approach to setting the MACT floor for combustion turbines. The commenter believes that simplified, more flexible, and less onerous requirements that can meet the risk criteria set out in the CAA would provide a much more cost effective rule while providing adequate health and environmental protection.

IX.8 Comment: Commenter 487 supported the use of 112(d)(4) to provide relief for small, low-emitting, co-located, natural gas fired combustion turbines, since the installation of additional controls would provide limited to inconsequential benefit. The commenter referred to a study conducted by the GTA in August 2002 which included human health risk modeling for natural gas fired GE Frame 6B turbines and showed the health risk for formaldehyde to be well below the cancer risk threshold of one in one million.

IX.9 Comment: Commenter 460 believes that the source-by-source approach under section 112(d)(4) may be too cumbersome for the CT source category and that the more streamlined approach of delisting a low risk subcategory is more appropriate. The commenter

believes a "low risk subcategory" approach is authorized under section 112(c)(9) and is appropriate for the stationary combustion turbine category. It is likely that all diffusion flame units firing natural gas and many stationary combustion turbines using oil for periods longer than authorized in the delisting petition would in fact meet the statutory delisting criteria. However, due to variability in locations and configuration, it can not be categorically concluded that this is the case for every existing source. Therefore the commenter believes it is critical that sources have the ability to opt into a low risk subcategory and achieve a "delisted" status. The commenter urged EPA to adopt this approach and implement it in issuing the final rule.

IX.10 Comment: Commenter 479 stated that EPA should consider delisting stationary combustion turbines as a source category under section 112(c)(9) of the CAA and 40 CFR 63 subpart C.

Commenter 479 stated that combustion turbines are already among the cleanest-burning sources of power in operation today. New turbines are subject to permit restrictions that require best available control technology for many pollutants including NOx. EPA must carefully consider its cost-effectiveness conclusions in the CT MACT, especially in light of comments provided. Recent studies conducted by TRC indicate that HAP emissions from all gas turbines in the U.S. represent a cancer risk or well below one in one million and the non-cancer risks are well below levels EPA considers to protect public health with an adequate margin of safety. The commenter added that there are a number of benefits of delisting the source category. The most important benefit of delisting is the encouragement of further use of this clean and efficient source of power generation.

IX.11 Comment: Commenter 440 stated that sources wishing to take advantage of the risk-based compliance option would take a federally-enforceable permit limit that would guarantee that their emissions remain below the risk-based emission standard. This would constitute an "emission limitation" - within the statutory definition of the term - and it would allow sources to forego the installation of incinerators where they are not warranted by public health and environmental considerations.

IX.12 Comment: Multiple commenters are opposed to the risk-based exemptions (472, 387, 489, 514, 518, 470, and 483).

Commenter 472 believes that the proposed §112(d)(4) applicability cutoffs are flatly unlawful. However, the commenter provided additional comments on several issues for which EPA solicited comment.

Commenters 387 and 470 noted that the proposal to include risk-based exemptions is critically flawed and opposes adoption of the risk-based exemptions into MACT.

Commenter 489 stated that the inclusion of case-by-case risk-based exemptions into the first phase of the MACT program will negate the legislative mandate and jeopardize the effectiveness of the national air toxics program to adequately protect public health and the environment and to establish a level playing field. Therefore, the commenter strongly disagrees with inclusion of risk-based exemptions in the MACT standard process. The commenter was very concerned that EPA referenced a fundamentally flawed interpretation of §112(d)(4) written by an industry (AF&PA) subject to regulation. Of particular concern was AF&PA's unprecedented proposal to include "*de minimis* exemptions" and "cost" in the MACT standard process.

Commenter 518 is extremely concerned about the policy and technical implications of

the risk-based exemption proposal. Because of the flaws with the proposal, the commenter is opposed to the adoption of the risk-based exemptions to MACT.

Commenter 515 stated the belief that the use of risk-based concepts to evade MACT applicability is contrary to the intent of the CAA and is based on a flawed interpretation of section 112(d)(4) of the CAA. The commenter added that the CAA requires a technology-based floor level of control and does not provide exclusions for risk or secondary impacts from applying the MACT floor. Commenter 515 stated that from a practical standpoint, the approaches (to risk-based exemptions) in the preamble are not appropriate.

IX.13 Comment: Commenter 470 stated that, under the MACT floor approach, processes which are technologically too expensive to control would, in most cases, have a MACT floor of no control, which could be reevaluated when EPA conducts the residual risk assessment required by section 112(f). Congress intended that this process be used to reduce the initial cost of the MACT program.

IX.14 Comment: Commenter 465 is opposed to the risk-based exemptions and called upon EPA to promulgate the remaining technology-based MACT standards without the risk-based exemptions.

IX.15 Comment: Multiple commenters (514, 387, 518, 433, 470, and 465) believe that the preambles of individual rule proposals were an inappropriate forum for introducing significant changes in the way that MACT standards are established. Precedent-setting change of the magnitude that EPA has raised should be discussed openly and carefully with all affected parties instead of being buried in the preambles of individual standards.

Commenter 515 stated the concern that other parties may miss commenting on the risk-based exemptions because they are contained within six separate proposals. The commenter added that to give the issue full consideration, the risk provisions should not be adopted within any of the final rules but should be addressed in one place, such as in revisions to the general provisions of 40 CFR 63 subpart A.

Commenter 489 stated that for many years, they have coordinated with OAQPS on development of MACT standards for the national air toxics program, and there has been no indication of any kind regarding inclusion of risk-based exemptions in the first phase of the MACT program. The commenter thought it was unprecedented and alarming that EPA is proposing such a radical change at the end of Phase 1 of the MACT standard process. Commenter 489 believes that allowing risk-based exemptions requires changes to existing law and that such a debate should take place within the democratic legislative process and not in the MACT standard process.

IX.16 Comment: Commenter 518 stated that the preamble discussion of the risk-based approaches is not sufficient to allow for complete public comment and, therefore, it would not be appropriate for EPA to go directly to a final rule (without reproposal) with any of the approaches outlined in the proposal. The commenter recommended that the risk-based exemption proposal be dropped because it is unacceptable.

Commenters 465 and 470 stated that the use of sub-categorization and source category deletions under section 112(c) have been implemented several times since the MACT program began. The commenters have been unable to comment on the technical merit of the risk analysis employed by the EPA. Until the residual risk analysis procedures have been implemented via the section 112(f) process, risk analysis should not been used in making MACT determinations

pursuant to section 112(d)(4) and, could never be used to establish a MACT floor.

IX.17 Comment: Commenters 514, 387, 518, 433, 489, 465, 470, and 483 stated that the proposal to include risk-based exemptions is contrary to the 1990 CAA Amendments (CAAA) which calls for MACT standards based on technology rather than risk as a first step. Congress incorporated the residual risk program under §112(f) to follow the MACT standards (not to replace them). The need for the technology-based approach has been recently reinforced by the results of the National Air Toxics Assessment (NATA), which indicates that exposure to air toxics is very high throughout the country in urban and remote areas. Commenters 518, 387, 433, 470, and 483 added that risk-based approaches will be used separately to augment and improve technology-based standards that do not adequately provide protection to the public. Commenter 489 believes that section 112(b)(4) of the CAA and the regulatory precedent established in over 80 MACT standards rejects the inclusion of risk in the first phase of the MACT standards process. Commenter 514 added that section 112(f) of the CAA was developed to address residual risks remaining after implementation of technology-based MACT standards and was intended to provide additional protection, not replace technology controls. Commenter 489 added that they have been unable to substantiate the basis for EPA's support of the regulatory relief sought by industry through risk-based exemptions. In fact, the use of risk assessment at this stage of the MACT program is directly opposed to Title III of the CAA. Commenter 489 attached an EPA fact sheet and testimony by two individuals that supports this position.

IX.18 Comment: Commenters 514, 387, 465, 518, 433, and 470 stated that the proposal to allow risk-based exemptions would divert back to the time-consuming NESHAP development process that existed prior to the CAAA. Under this process, which began with a risk assessment step, only eight NESHAP were promulgated during a 20-year period. If the proposed approaches are inserted into upcoming standards, the commenters fear the MACT program (which is already far behind schedule) would be further delayed.

IX.19 Comment: Commenters 387, 465, 518, 433, 489, and 470 stated that the risk-based exemption proposal removes the "level-playing field" that would result from the proper implementation of technology-based MACT standards. Establishing a baseline level of control is essential to prevent industry from moving to areas of the country that have the least stringent air toxics programs, which was one of the primary goals of developing a uniform national air toxics program under section 112 of the 1990 CAA amendments. The risk-based approaches would jeopardize future reductions of HAPs in a uniform and consistent manner across the nation.

Commenters 387 and 470 stated that the NATA data show that virtually no area of the country has escaped measurable concentrations of toxic air pollution. The NATA information indicates that exposure to air toxics is high in both densely populated and remote rural areas.

IX.20 Comment: Multiple commenters (443, 502, 440, and 460) believe that section 112(d)(4) provides EPA with authority to exclude sources that emit threshold pollutants from regulation. The commenters indicated that section 112(d)(4) allows for discretion in developing MACT standards for HAP with health thresholds. This is consistent with the plain language of the statute, which states that:

> "With respect to pollutants for which a health threshold has been established, the Administrator may consider such threshold level, with an ample margin of safety,

when establishing emission standards under this subsection."

The use of section 112(d)(4) authority also is supported by CAA's legislative history, which emphasizes that Congress included §112(d)(4) in the CAA to prevent unnecessary regulation of source categories.

Multiple commenters (443 and 440) referenced Sen Rep. 101-228, at 176 (1989), reprinted in 1990 U.S.C.C.A.N. 3385, 3560:

> "[W]here some sources do emit more than the threshold amount, the Administrator is authorized by section 112(d)(4) to use the no observable effects level or NOEL (again with an ample margin of safety) as the emission limitation in lieu of more stringent "best technology" requirements. Following this scenario, only those sources in the category which present a risk to public health (those emitting in amounts greater than the safety threshold) would be required to install controls, even though the general policy is "maximum achievable technology everywhere." Again, there is a means to avoid regulatory costs which would be without public health benefit."

Commenter 440 pointed out that EPA has exercised such authority and cited the Pulp and Paper MACT. In addition, in the Pulp and Paper MACT, EPA identified circumstances in which they would decline to exercise 112(d)(4) authority–where significant or widespread environmental harm would occur as a result of emissions from the category and the estimated health thresholds are subject to substantial scientific uncertainty. EPA determined that these considerations were not relevant to emissions from the pulp and paper source category, and the commenter believes that the same is true for their source category and that the same treatment is warranted for many facilities within the source category. The commenter noted that facilities that cannot meet the risk criteria would remain subject to the MACT requirements.

IX.21 Comment: Commenter CT-440 stated that EPA invoked §112(d)(4) authority in choosing not to impose control requirements on HCl emissions from chemical recovery furnaces at pulp mills (40 CFR part 63, subpart MM). See 63 Fed. Reg. 18754, 18765 (April 15, 1998).

IX.22 Comment: Commenter 440 stated that the risk-based approaches can be implemented as an "emission standard" within the statutory definition of the term. The commenter stated that the risk-based approaches being considered by EPA can, and should, be implemented as compliance options, rather than outright exemptions from MACT standard applicability. This approach fits with the statutory definition of "emission standard" and "emission limitation" as used in §112. Nothing in the definition equates "emission standard" with the requirement to install control technology. If the risk-based approach is implemented as a compliance option, then the "emission standard" set by EPA would be the emission rate that corresponds with the concentration of HAP at the property line that is below the health benchmark for threshold HAPs, and below the one in a million risk level for non-threshold carcinogens.

Commenter 440 stated that EPA's implementation of the risk-based approach as a compliance option clearly would meet the statutory definitions of "emission limitation" and "emission standard" (defined identically by CAA § 302(k)) by placing federally-enforceable limitations on facility HAP emissions. That this cap would be based on correlations with risk-based property line concentrations does nothing to detract from this conclusion.

IX.23 Comment: Commenters 443 and 430 supported the use of §112(d)(4) applicability

cutoffs for both threshold and non-threshold pollutants.

Commenters 443 and 487 stated that the plain language of 112(d)(4) does not distinguish between carcinogens and non-carcinogens.

Commenter 443 stated that advances in risk assessment science indicate that some carcinogens may be threshold pollutants.

Commenter 430 believes that a health threshold of one in one million cancer risk is appropriate for non-threshold pollutants.

IX.24 Comment: Commenter 502 believes that EPA could implement a section 112(d)(4) emissions limitation under both the first and third scenarios discussed in the preamble (scenario 1: exempt low risk facilities emitting only threshold pollutants, scenario 3: exempt emission points at facilities that emit only threshold pollutants). However, the commenter believes that the use of a section 112(d)(4) emissions limit as described under the third scenario in the preamble would provide the maximum benefit of the section 112(d)(4) provision. Under this scenario, facilities that emit both threshold and nonthreshold pollutants could achieve exemption from MACT controls for threshold HAP emission points based on their ability to meet the associated health threshold for those HAP. Another possible use of the section 112(d)(4) emissions limitation that EPA discussed would apply to both threshold and nonthreshold pollutants.

IX.25 Comment: Several commenters (515, 425, and 489) disagreed that §112(d)(4) can be interpreted to allow exemptions for individual sources. The commenters believe that §112(d)(4) applies to categories of sources. Commenter 425 understood section 112(d)(4) to allow the Agency to reduce the stringency of a MACT standard *applicable to an entire category or subcategory* based on a health threshold for a particular pollutant.

IX.26 Comment: Multiple commenters (472, 465, and 470) stated that the plain meaning of §112(d)(4) does not allow EPA to make MACT standard exemptions for individual sources.

Commenter 472 stated that the CAA does not allow EPA to "exempt individual facilities that can demonstrate that their emissions will not result in air concentrations above the threshold levels with an ample margin of safety even if the category is otherwise subject to MACT." The CAA provides only that "with respect to pollutants for which a health threshold has been established, the Administrator may consider such threshold level, with ample margin of safety, when establishing emission standards under this subsection." Had Congress intended to give EPA discretion to consider threshold levels in exemption of facilities from compliance, the CAA would have said so. The applicability cutoffs on which EPA requests comment are unlawful.

Commenters 465 and 470 believe that EPA has misinterpreted the provision in 112(d)(4). Section 112(d)(4) does not state that EPA can use applicability thresholds "in lieu of" the section 112(d)(3) MACT floor requirements. The commenters interpreted section 112(d)(4) to state that health based thresholds can be considered when establishing the degree of the MACT floor requirements, but it should not be used to supplant the requirements established pursuant to Section 112(d)(3).

IX.27 Comment: Commenter 472 stated that the legislative history of §112(d)(4) clearly rejects EPA's proposed facility-by-facility MACT exemptions. The commenter noted that Congress considered and rejected the applicability cutoffs upon which EPA now solicits comment. The House version of the 1990 Amendments allowed States to issue permits that exempted a source from compliance with MACT rules if the source presented sufficient evidence

to demonstrate negligible risk. The Senate version of the 1990 Amendments contained no such provision. In conference, Congress considered both the House and Senate versions and rejected the House bill's exemption for specific facilities in favor of the Senate bill's language.

IX.28 Comment: Several commenters (515, 489, and 472) stated that section 112(d)(4) does not apply for source categories that emit carcinogens.

Commenter 472 stated that even if the §112(d)(4) applicability cutoffs were not unlawful, they would be unlawful for the SCALDT and CT source categories because these categories emit carcinogens (e.g., SCALDT emits benzene, formaldehyde, EGBE, and nickel compounds; CT emits benzene, formaldehyde, 1,3-butadiene, acetaldehyde, arsenic, beryllium, cadmium, chromium, nickel, and lead).

IX.29 Comment: Commenter 472 stated that legislative history makes it clear the §112(d)(4) is only to be use when a there is a well-established health threshold. Commenter 472 cited legislative history that makes it clear that Congress did not intend EPA to establish and carcinogens as "threshold" pollutants under §112(d)(4).

IX.30 Comment: Commenter 518 stated that the concept of cancer exposure below a threshold is untried, and Congress clearly intended that carcinogens be considered non-threshold pollutants.

IX.31 Comment: Commenter 502 believes that EPA could accomplish the same outcome as a section 112(d)(4) emissions limitation if it applied an emissions limitation on nonthreshold pollutants using its inherent *de minimis* authority instead of a limit based on section 112(d)(4).

IX.32 Comment: Commenter 440 stated that a risk-based compliance option for both threshold and non-threshold HAPs is well within EPA's authority under the CAA and the *de minimis* doctrine articulated by appellate courts. The commenter stated that appellate caselaw makes clear that EPA may lawfully exempt *de minimis* sources of risk from MACT-level controls because the legislative mandate of CAA § 112 is not "extraordinarily rigid" and the exemption is consistent with the CAA's health-protective purpose. CAA §§ 112(c)(9) and 112(f)(2) clearly indicate that Congress considered a cancer risk below one in a million to be *de minimis* and therefore insufficient to justify regulation under CAA § 112. Under this approach, EPA would specify an emission standard as a *de minimis* level of cancer risk, and sources would have the option to comply with the NESHAP by demonstrating that their emissions result in exposures below this risk level.

Commenter 440 argued that EPA's *de minimis* authority properly is evaluated *vis-à-vis* the statutory design. Appellate caselaw establishes EPA's authority to exempt *de minimis* sources as long as the legislative mandate is not "extraordinarily rigid" and the exemption is consistent with the legislative purpose - in this case, the "health protective purpose of the statute." Commenter 440 cited *Alabama Power Co. v. Costle*, 636 F.2D 323 (D.C. Cir. 1979) where the court explained that categorical exemptions from the requirements of a statute may be permissible:

> [A]s an exercise of agency power, inherent in most statutory schemes, to overlook circumstances that in context may fairly be considered *de minimis*. It is commonplace, of course, that the law does not concern itself with trifling matters, and this principle has often found application in the administrative context. Courts should be reluctant to apply the literal terms of a statute to mandate pointless expenditure of effort. 636 F.2D at 360.

The commenter also cited the more recent D.C. Circuit decision that:

> As long as the Congress has not been extraordinarily rigid in drafting the statute, however, there is likely a basis for an implication of *de minimis* authority to provide an exemption when the burdens of regulation yield a gain of trivial or no value. *Environmental Def. Fund v. EPA*, 82 F.3D 451, 466 (D.C. Cir. 1996)

Commenter 440 stated that EPA's frequent exercise of its *de minimis* authority has withstood judicial challenge. The Agency's application of this authority, as well as its treatment by reviewing courts, uniformly has turned on the degree of risk at issue, not on the mass of emissions to be regulated. The commenter stated that appellate courts consistently have upheld EPA's application of its *de minimis* authority in a line of cases that, according to the D.C. Circuit, have established "virtually a presumption in its favor." *Public Citizen v. Young*, 831 F.2D at 1113. These decisions include the following:

-*EDF v. EPA*, 82 F.3D 451, 466, 469 (D.C. Cir. 1996)
{This case deals with EPA's transportation conformity regulations promulgated under CAA section 176}

-*Public Citizen*, 831 F.2D at 1112

-*Ohio v. EPA*, 997 F.2D 1520 (D.C. Cir. 1993)
{This case deals with *de minimis* exemptions from CERCLA requirements on the basis of no appreciable health risk}

-*Alabama Power Co.*, 636 F.2D at 360

-*Ober v. Whitman*, 243 F.3D 1190 (9th Cir. 2001)
{This case deals with exemption of *de minimis* sources of PM_{10} under a FIP}

-*Industrial Union Dept., AFL-CIO v. American Petroleum Inst.,* 448 U.S. 607, 663-64 (1980).

Commenter 440 stated that the D.C. Circuit has invalidated EPA's *de minimis* authority only where it was applied under statutory designs that are "extraordinarily rigid." In *Public Citizen*, the D.C. Circuit refused to allow a *de minimis* exception to the "Delaney Clause" in the Pure Food and Drug Act, which provided that a color additive will be deemed unsafe if it is found to induce cancer in man or animal. 831 F.2D at 1108. In distinguishing its own precedent, the D.C. Circuit later noted that "[t]he Public Citizen court relied heavily on the almost inescapable terms of the Delaney Clause and the substantial legislative history supporting an absolutist application of the language." Ohio, 997 F.2D at 1534 (emphasis added, quotations omitted). As discussed below, CAA § 112 contains no such absolutist language so as to preclude EPA's application of its *de minimis* authority.

IX.33 Comment: Commenter 440 stated that the statutory design and legislative purpose expressed in CAA § 112 fully justify emission standards based on *de minimis* levels of cancer risk. The roots of *de minimis* authority exist in the language of CAA §112, and CAA §112 itself provides clear indication of congressional intent as to what constitutes a *de minimis* cancer risk for purposes of MACT. Congress expressly included *de minimis* provisions in the Title III program. Despite its initial emphasis on MACT-based control technology, the overall structure of CAA § 112 is overwhelmingly risk-based. This emphasis on risk renders *de minimis* considerations especially appropriate. Unlike, e.g., the Delaney Clause, CAA §112's mandates are not absolute. For example, CAA §112(c)(9)(B)(i) authorizes source category delisting if the

category (or subcategory) creates less than a 10^{-6} cancer risk; CAA §112(c)(9)(B)(ii) allows delisting if non-carcinogenic HAP emissions do not exceed levels adequate to protect public health with an ample margin of safety. Congress included *de minimis* principles in §112(g)(1). In addition, Congress included other provisions in CAA § 112 that demonstrate that the statutory design is not "extraordinarily rigid." See, e.g., CAA §§112(a)(2) and (c)(3); 112(a)(7); 112(c)(7); 112(f)(2)(C); 112(d)(5) and (f)(5); and 112(i)(5)(E).

Commenter 440 stated that CAA §112 provides clear indication of Congressional intent as to the degree of risk that properly is to be considered *de minimis*. A cancer risk of one in a million is the touchstone for further review under the "residual" risk provision of CAA §112(f). (The residual risk provisions thus call for additional controls if and only if the remaining risk from affected sources exceeds one in a million, but do not call for a reduction of risk to the MEI below this level. Rather, the provisions generally call for reduction of MEI risk to a level no higher than 1 in 10,000, although in some cases, risks greater than 1 in 10,000 may be allowable.) Similarly, a one in a million cancer risk is the threshold below which EPA is authorized under CAA §112(c)(9)(B) to remove entire source categories from the purview of MACT regulation. Where Congress has authorized the wholesale removal of entire source categories on the basis of a cancer risk below one in a million, EPA is certainly warranted in exercising its *de minimis* authority to provide a significantly more limited emission standard premised on the same level of risk.

IX.34 Comment: Commenter 440 cited EPA's brief in *National Lime Association v. EPA*, 233 F.3D 625 (D.C. Cir. 2000) and noted that the D.C. Circuit held that EPA reasonably declined to provide a *de minimis* exemption on the basis of cost for the Portland Cement NESHAP, but the court did not limit EPA's *de minimis* authority under CAA §112 in any other way.

IX.35 Comment: Commenter 440 contended that use of the phrase "*de minimis*" in CAA § 112(g)(1) does not limit EPA's exercise of its *de minimis* authority in the MACT context. Although the phrase "*de minimis*" is only used in CAA § 112(g)(1), there is no legal or policy basis for assuming that Congress intended to preclude EPA's exercise of its *de minimis* authority in every other regulatory context affecting HAPs. Federal agencies, including EPA, are presumed to have *de minimis* authority regardless of whether such authority is expressly granted by statute. Appellate caselaw recognizes that federal agencies have an inherent authority to exempt *de minimis* sources of risk from even highly prescriptive statutory requirements, so long as the legislative mandate is not "extraordinarily rigid" (*EDF*, 82 F.3D at 466) and the exemption is consistent with the legislative purpose (here, the health-protective purpose of the CAA). The commenter argued that CAA §112 is not "extraordinarily rigid" and that Congress had ample opportunity to make §112 "extraordinarily rigid" when it developed the 1990 CAAA.

The commenter stated that EPA's exercise of its *de minimis* authority under CAA § 112 is consistent with traditional canons of statutory interpretation. The argument that the isolated use of the term "*de minimis*" in CAA § 112(g)(1) somehow precludes the exercise of EPA's *de minimis* authority in setting the MACT floor does not withstand scrutiny under principles of statutory interpretation for three reasons: (1) the use of a term in one statutory provision is, at most, a weak indicator of congressional intent to foreclose the term's application in other statutory provisions (See, e.g., *Mourning v. Family Publications Serv., Inc*., 411 U.S. 356 (1973) and also *United States v. Vonn*, 535 U.S. 55 (2002) summarized on pp. 43-44 of 440); (2) the

preclusive effect of the isolated use of a term is even more attenuated where, as here, the provision in which the term appears has little in common with the provision in which its absence would be interpreted (see *City of Columbus v. Ours Garage & Wrecker Serv.,* 536 U.S. 424 (2002)); and (3) any purported preclusive effect is weakened further in the context of agency rulemaking, such as the process of MACT standard setting.

IX.36 Comment: Commenter 472 stated that EPA refers to, but does not discuss, a third "deregulatory" option that "would involve the use of a concentration-based applicability threshold. Given that EPA did not explain the approach, it is impossible to comment on it and it has not been proposed sufficiently to include it in a final rule. The commenter added that, in general, EPA needs to remember that the CAA requires it to "promulgate regulations establishing emission standards for each category or subcategory of major sources or area sources of hazardous air pollutants listed for regulation pursuant to subsection (c)..." The commenter also provided a definition of "major source" and "stationary source" and stated that based on those EPA definitions, EPA's 112(d) standards must apply to each emission point at each source, and the agency cannot exempt any emission point based on the belief that its emissions have a low concentration of HAP.

IX.37 Comment: Regarding the use of a concentration-based applicability threshold, commenters 465 and 470 stated that this is not what Congress intended in the CAAA of 1990. Congress mandated that the MACT floor be established as initial level of control.

IX.38 Comment: Commenter 502 stated that in the preambles, EPA expresses uncertainty over whether it has the authority to subcategorize source categories based on risk. The commenter believes that EPA has ample authority, based on sections 112(c)(1) and 112(d)(1), to subcategorize based on risk. Section 112(c)(1) states: "Nothing in the preceding sentence [relating to following the NSPS program categories and subcategories] limits the Administrator's authority to establish subcategories under this section as appropriate." Thus, Congress allowed EPA discretion to subcategorize previously created categories, regardless of the criteria that EPA used to create the category in the first place, and to do so at any time. Section 112(d)(1) provides that EPA "may distinguish among classes, types and sizes of sources" when establishing MACT standards. The broad terms "classes," "types," and "sizes" indicate that Congress intended that EPA have broad discretion in establishing subcategories and do not preclude EPA from subcategorizing based on risk, since low-risk sources could be considered a "class" or "type" of source. The commenter added that the only case to clarify this statutory language recognized the broad discretion it confers on EPA to create subcategories with different emission standards. *Sierra Club v. Costle,* 657 F.2D 298 (D.C. Cir. 1981). The Court noted, "[t]he required finding that must underlie a variable standard is much broader than a mere determination that uniformity is not achievable." *Id.* at 321. On this basis, the Court expressly upheld EPA's subcategorization of coal-fired power plants based on the sulfur content of fuel. More generally, the *Sierra Club* decision confirms EPA's discretion to set differentiated emissions standards for subcategories of sources, even in instances where the strictest standard may be achievable by all sources.

IX.39 Comment: Commenter 472 stated that subcategory delisting under §112(c)(9)(B) is flatly unlawful. Section 112(c)(9)(B) provides that EPA "may delete any source category" from the §112(c) list upon making certain determinations. Congress was well aware of the difference between a "category" and a "subcategory" when it enacted §112(c). When Congress

wished to refer to both subcategories and subcategories, it did so expressly. By referring only to "category," Congress made plain that §112(c)(9)(B) does not allow EPA to delist a "subcategory" for any reason.

Commenter 425 did not see legal basis for creating a subcategory based on risk alone.

IX.40 Comment: Commenter 472 stated that even if EPA could delist a subcategory, it could not do so based on risk. Section 112(c) states that "[t]o the extent practicable, categories and subcategories listed under this subsection shall be consistent with the list of source categories established pursuant to section 111 and part C," and the commenter stated that subcategories based on risk would not be consistent with either the section 111 list or part C. The commenter added that EPA has interpreted the statement regarding subcategorizing by "classes, types, and sizes" in section 112(d) to mean that subcategories must share physical characteristics relevant to the degree of pollution control that can be achieved. Because risk is not such a characteristic, EPA may not subcategorize based on risk. The commenter also added that risk-based subcategories would be at odds with Congress's purpose in enacting section 112–i.e., requiring technology-based standards with a performance-based floor–which was intended to overcome the difficulties EPA encountered in completing health-based standards. In addition, the commenter added that EPA has not provided a reason for departing from its current interpretation of the guidelines for establishing subcategories other than to avoid setting emission standards. Thus, subcategorization based on risk, including under the pretense of subcategorization by technology (which EPA admits to considering), would be unlawful.

IX.41 Comment: Commenter 472 stated that EPA did not propose any subcategories for delisting, and if EPA wanted to delist a subcategory, the would have to propose the delisting and allow the public to comment. The commenter added that instead of creating further delays with such a process, EPA should consider that its standards are already late and should focus its resources on completing the overdue standards instead of providing unlawful exemptions for industry groups that wish to avoid cleaning up their hazardous air pollution.

IX.42 Comment: Commenter 515 stated that the only option that appears consistent with the CAA, does not create excessive work for State and local agencies, and may be able to be based on science, is the subcategorization and delisting approach. However, the commenter added that the subcategories should be based on equipment or fuel use, not risk. The commenter added that a subcategory based on site-specific risk creates a circular definition and does not make sense. The commenter also stated that subcategory de-listing should occur before the compliance date so that facilities don't put off compliance in the hope or anticipation of de-listing.

Commenter 515 supported identifying and excluding technology-based subcategories (that include low risk facilities) and long as the 112(c)(9)(B) concepts are met (i.e., less than 10-6 cancer risk, and no source exceeds ample margin of safety level).

IX.43 Comment: Commenter 425 urged caution in the effort to define a permissible subcategory based upon technological differences that would then be susceptible to delisting under the extremely stringent delisting requirements of section 112.

IX.44 Comment: Commenter 449 suggested an alternative applicability criteria of 1 tpy formaldehyde in order to focus the rule on higher-emitting units and relieve low-emitting units of the burden of MACT regulation, given that nearly all turbines will be subject to the turbine MACT as a result of co-location with other emission sources. The commenter stated that

applicability based solely on power output does not address the variability of formaldehyde emissions for various turbine models, and provides little incentive for turbine manufacturers or owner/operators to reduce emissions since all units rated more than 1 MW would be regulated.

Commenter 422 suggested that EPA add an additional risk-based threshold (a mass-based threshold) for well operated/controlled turbines with emissions less than 1 tpy of formaldehyde. The commenter cited a precedent in subpart HH, Oil and Natural Gas Production MACT, in which glycol units with benzene emissions less than 1 tpy were exempt because "the EPA's analysis indicated that control of HAP emissions below these cutoff levels was not cost-effective for area source glycol dehydration units."

IX.45 Comment: Commenter 515 stated that the preamble discussion of a low-risk subcategory on the MACT floors for the entire category sounds like another valid reason not to mix the risk-based and technology-based standards development. The commenter added that EPA does not address how the "once in, always in" policy would apply.

IX.46 Comment: Commenter 502 supported the concept described in the preambles regarding the establishment of the MACT floor based on the controls for the entire source category. The commenter agreed that considering controls for low-risk subcategories could maintain the appropriate stringency of the MACT floor. Once the floor is established, facilities could demonstrate their inclusion in the low-risk category that is subsequently listed.

IX.47 Comment: Commenter 445 agreed that the MACT floor could be established for the entire source category and then facilities could be allowed to become part of a low-risk subcategory in the future, after MACT standards are established. This would allow low risk facilities to use section 112 (c)(9) without affecting the MACT floor.

IX.48 Comment: Commenter 440 stated that EPA cannot rely solely on the health benchmarks in the IRIS database. The commenter stated that EPA's Integrated Risk Information System (IRIS) database is a useful tool for obtaining information about the health effects of concern for individual chemicals. However, IRIS is far from definitive, as Agency resource constraints have resulted in many chemical summaries that are significantly outdated and do not reflect the most recent scientific developments. Moreover, the IRIS database is a non-statutory, in-house Agency activity, and IRIS entries are not subject to formal notice and comment. Not surprisingly, therefore, EPA management has repeatedly emphasized that the Agency is required to consider other information, in addition to the IRIS database, when evaluating the health effects of chemicals in a regulatory context. The commenter referenced several EPA directives regarding use of IRIS. The commenter concluded based on these directives that when evaluating chemicals in a regulatory context, EPA must use a scientifically appropriate health benchmark, and when determining that health benchmark, EPA must consider all relevant information to ensure that the health benchmark is up-to-date and scientifically credible - even if that means departing from the value in IRIS.

IX.49 Comment: Commenter 489 stated that the proposals inappropriately use draft guidelines and toxicity profiles that have not been subject to public review and/or are not publicly available. The commenter was particularly concerned with the reference to the use of non-linear carcinogenic risk values and toxicity profiles (for HAP) that have not been finalized and are not available for review by the public.

IX.50 Comment: Commenter 465 agreed with EPA's choice to derive their data from IRIS, CAL-EPA and ATSDR for its documentation for establishing risk based threshold and

non-threshold values. The commenter added that almost all HAP are being reviewed and reevaluated on a regular basis, and it would be inappropriate to single out formaldehyde and acetaldehyde at this time. EPA can only rely on what is currently published and underwent either peer review or agency review. The issue of changing health-based guideline values will always be a concern once health-based regulations are promulgated.

IX.51 Comment: Commenter 445 encouraged EPA to allow local agencies and states to use more stringent risk factors in instances where the California Office of Environmental health hazard assessment has more stringent risk values than EPA. The commenter also requested that EPA to recognize state or local programs that require more stringent toxic control strategies or technologies than federal guidelines.

IX.52 Comment: Commenter 440 pointed out that EPA's initial IRIS entry was completed in 1987 and the Agency's core conclusions and analysis have remained untouched for more than 15 years. The science, however, has not remained stagnant; in fact, the weight of scientific evidence should now preclude the use of the IRIS unit risk factor for formaldehyde. As a result, the commenter believes that EPA should base its unit risk factor of the CIIT study (described in detail on pages 48-52 of comment 440), and conclude that formaldehyde exposures at or below 0.6 ppm pose less than one in one million risk of respiratory tract cancer. As an alternative, EPA could rely on recent work of Health Canada and Environment Canada in identifying a fenceline concentration for formaldehyde that amply protects human health. The commenter noted that the CIIT report underwent extensive peer review by CIIT, U.S. EPA, Health Canada, and other peer reviewers. The commenter also noted that EPA should calculate a unit risk factor for formaldehyde, whether through the IRIS process or simply as part of the CT rulemaking.

IX.53 Comment: Commenter 440 stated that acetaldehyde is similar to formaldehyde structurally and toxicologically, and is expected to be similar mechanistically. As with formaldehyde, the current state of the science suggests that it would be inappropriate to rely on the unit risk factor in the IRIS database. The commenter supported EPA's ongoing efforts to revise the IRIS value for acetaldehyde (and formaldehyde) and believes that the updated value should be used for establishing fenceline concentration thresholds in the CT MACT. However, if EPA is unable to complete the reassessment for acetaldehyde, the current IRIS value should not be used. Based on a peer-reviewed Health Canada study (details provided on pages 55 and 56 of 440), the available data on acetaldehyde suggest that the non-cancer health benchmark will be at least as conservative, if not more, as the health benchmark to protect against carcinogenic effects. Accordingly, EPA should use a non-cancer health benchmark. Health Canada's health benchmarks cannot be compared directly to the one in a million risk level calculated from EPA's unit risk factor, because of the non-linear nature of the acetaldehyde dose-response curve. As stated in the TERA-ITER database, "[i]t would not be appropriate to use linear extrapolation procedures to aid in the comparison of Health Canada's tumerogenic concentration with 5% response (TC05) with U.S. EPA's cancer assessment because the risk below the TC05 will fall off dramatically because of the highly nonlinear dose-response relationship for acetaldehyde." Nonetheless, it is clear that a one in a million risk level based on Health Canada's extrapolation approach would be much higher than U.S. EPA's cancer risk value of 0.5 $\mu g/m^3$. A rough extrapolation of the one in a million risk level for acetaldehyde (assuming the mode of action is similar to formaldehyde and, therefore, changing the acetaldehyde cancer slope factor to reflect

non-linearity and differences between rat and human nasal anatomy) shows that the acetaldehyde dose is 134 times higher than the formaldehyde dose. Applying this ratio to the 0.6 ppm level for formaldehyde (based on the CIIT formaldehyde study) results in a one in a million risk level of 80.4 ppm (144,000 $\mu g/m^3$) for acetaldehyde–a value that is quite close to the TC05 calculated by Health Canada (86,000 $\mu g/m^3$). While the calculation may not necessarily be accurate, the value does illustrate that the non-cancer benchmark almost certainly will be more conservative than the one in a million cancer risk for acetaldehyde. Therefore, the commenter recommended establishing fenceline concentration levels for acetaldehyde based on protection against non-cancer health effects, and believes that a benchmark between 27 and 390 $\mu g/m^3$ is the most scientifically appropriate. At a minimum, EPA should based its fenceline concentrations for acetaldehyde on the existing IRIS RfC of 9 $\mu g/m^3$, rather than extrapolating to a one in a million risk level using the IRIS unit risk factor.

IX.54 Comment: Commenter 440 stated that EPA may properly treat formaldehyde and acetaldehyde as threshold pollutants. Based on their specific comments regarding the need to update the health benchmarks for formaldehyde and acetaldehyde, the commenter believes that there is a concentration of these pollutants which reasonably can be considered a NOEL. The legislative history of the CAA clearly establishes that Congress considered threshold pollutants to be those for which a NOEL can be identified. The commenter added that the historic assumption that all carcinogens are non-threshold pollutants that may trigger a carcinogenic effect at any dose level is incorrect because at low levels, the carcinogenic risk from formaldehyde and acetaldehyde is so small as to be unmeasurable.

Commenter 515 stated that EPA should consider formaldehyde and acetaldehyde as carcinogens unless a reassessment classifies them as threshold pollutants.

IX.55 Comment: Commenter 440 stated that consideration of background and multipathway exposures is not required by law and is not necessary for sound policy. The commenter explained that the exclusive focus on the emissions from a source in making regulatory decisions under CAA § 112 is evident in all of the statutory provisions on which EPA would rely to implement the risk-based mechanisms (i.e., 112(d)(4), 112(c)(9)(B), or EPA's *de minimis* authority). As a result, EPA has no legal obligation to consider background or multi-pathway exposures. Moreover, the statutory focus on the MACT-regulated source further means that there is no legal obligation to model risks from the entire facility, but rather only the MACT-regulated portion of the facility. Commenter 440 also noted that EPA has existing regulatory programs (e.g., for mobile and area sources [Urban Air Toxics Strategy]) in place to address HAP emissions from other sources.

Commenter 440 stated that government surveys and EPA's regulatory actions demonstrate that non-inhalation exposures to the primary HAP emitted by CTs are insignificant and should not be considered in the risk analyses.

IX.56 Comment: Commenter 502 stated that making an allowance for other exposures under Section 112 is not necessary to protect public health. The commenter added that consideration of exposures from other sources places a disproportionate burden on major sources. Legislative history does not support the consideration of exposures from other source types when setting risk-based criteria. The commenter stated that multi-pathway risk assessment should be required only for those HAP that have the potential for causing significant multi-pathway exposure.

IX.57 Comment: Commenter 502 stated that uncertainty is already considered in the establishment of reference concentrations from which the HI is derived. The commenter stated that the uncertainty factors used in the NATA are large, and because of the considerable uncertainty adjustments that are already applied, it is highly unlikely that an ample margin of safety would ever have to include more uncertainties than are already incorporated in the RfCs. In some cases, the uncertainty corrections are too conservative.

IX.58 Comment: Commenter 443 stated that EPA should use reference concentrations (RfCs) and reference doses (RfDs) as the threshold for deciding whether a MACT standard for a specific pollutant is warranted. The RfCs and RfDs are set conservatively by first determining a NOEL and then reducing that level by an uncertainty factor. This method of setting RfCs and RfDs assures that public health is protected by "an ample margin of safety." Commenter 443 added that, as EPA suggests, the ample margin of safety for nonthreshold pollutants is a cancer risk that does not exceed one in one million.

IX.59 Comment: Commenter 502 stated that EPA should clarify that sources wishing to use the section 112(d)(4) emissions limit must only demonstrate compliance with risk-based thresholds for those four HAP that "account for essentially all of the mass of HAP emissions" for the CT source category: formaldehyde, toluene, benzene, and acetaldehyde. Commenter 502 stated, for example, that a CT MACT facility would demonstrate risk-based compliance with (d)(4) emissions limitations for threshold pollutants (toluene) and/or compliance with *de minimis* emissions limitations for non-threshold pollutants (formaldehyde, benzene, and acetaldehyde).

IX.60 Comment: Commenter 502 stated that hazard quotients for chemical mixes should not be summed to determine the hazard index (HI) unless the primary effects are on the same organ by the same mechanism; otherwise the risk will be overestimated.

IX.61 Comment: Commenter 502 stated that all risk-related provisions of Section 112 should be guided by the purpose of the ample margin of safety determination - namely, to account for uncertainty in the underlying health value. A hazard index equal to or greater than 1 should account for uncertainty and provide an ample margin a safety.

Commenter 502 stated that The Report of the Commission on Risk Assessment and Risk Management provides further guidance and supports the commenter's contention that a HI equal to or greater than 1 should provide an ample margin of safety for a threshold HAP.

IX.62 Comment: Commenter 502 stated that adoption of the Drinking Water Program's concept of a HI of 0.2 is not supportable. The commenter added that, at a minimum, before EPA could import the drinking water policy into air programs, the agency would need to evaluate the available scientific data–for the HAP of concern in each individual rulemaking–to determine wether the data justify a conclusion that 80 percent of the exposures to those pollutants come from sources outside the source category.

IX.63 Comment: Commenter 515 stated that the hazard index is useful in evaluating site-specific impacts, but choosing a generic HI (some multiple of 1) for application to a wide range of sites is inappropriate. The commenter added that selection of an arbitrary multiple of 1 is not science, does not conform with CAA section 112(d)(4) and does not protect public health. The commenter added that using background concentrations from NATA and a HI of 1 is inappropriate because NATA information includes warnings that the information is useful for large-scale planning purposes and not for local area assessment.

IX.64 Comment: Commenters 465 and 470 evaluated the four potential options that EPA

proposed to ensure that a risk analysis under section 112(d)(4) considers the total ambient air concentrations of all the HAPs to which the public is exposed. Option 1, which requires that the HI for all pollutants be no greater than 1, does not consider additional sources or background and is unacceptable. Option 3, which uses existing data such as the National Scale Air Toxics Assessment (NATA) to determine background and requires that the HI be no greater than 1, is also unacceptable. EPA has clearly stated at public meetings that the NATA is not to be used to make regulatory decisions. The NATA relies on data submitted to EPA voluntarily and has been reported to consistently underestimate measured concentrations. Until EPA requires that HAP inventories be submitted as proposed in the CERR, and the NATA conducts refined modeling around stationary sources, the NATA should not be considered for estimating background concentrations. Option 4, which allows individual facilities to monitoring the HAP backgrounds for use in their own analysis, will require oversight and evaluation by the States to ensure proper site selections and analytical methods and should not be considered. The commenters believe Option 2, which requires that the HI be no greater than 0.2, would be the only viable option at this time using a conservative risk screening analysis. However, the commenters did not endorse using any of the proposed threshold limit applicability methods to exempt process sources from NESHAP requirements.

IX.65 Comment: Commenter 518 referenced the greater than 10^{-6} risk associated with formaldehyde and benzene concentrations predicted by NATA and stated that uniformly applied NESHAP are needed to control these pollutants.

IX.66 Comment: Commenter 515 stated that the selection of a 0.2 hazard index as a rough screening tool seems reasonable, although it is unsupported by any analysis. The commenter added that if a default hazard index is used, EPA should include a provision that would disallow the use to exclude a facility from MACT, now or in the future, if better background information is available that suggests that the default does not protect public health. The commenter, however, believes that the interpretation that includes the use of such a default to allow exemptions for individual sources is not supported by the CAA, and the expansion of the interpretation to include non-threshold pollutants is in direct conflict with section 112(d)(4) of the CAA.

IX.67 Comment: Commenter 489 stated that EPA has not discussed the need to assess cumulative risks, aggregate exposures, and health impacts associated with exposure to chemical mixtures emitted from facilities within the source categories. The commenter referred EPA to the extensive progress that has been made in more completely addressing risks from exposure to air pollution and integrated decisionmaking in such areas as children's risk issues, cumulative exposure ("Framework for Cumulative Risk Assessment" (EPA/630/P-02/001A, April 23, 2002), and chemical mixtures (EPA/630/R-00/002). The commenter requested that the recent advancements be incorporated into the risk assessment methods and overall cost estimates associated with risk-based exemptions in the proposed rules.

Commenter 465 stated that the use of NATA to determine background concentrations is unacceptable. EPA has clearly stated at a number of public meetings that NATA is not to be used to make regulatory decisions.

IX.68 Comment: Commenter 518 stated that the proposal is critically flawed because risk-based exemptions ignore the cumulative risk that comes from exposure to multiple air toxics sources (e.g., hundreds of combustion engines and boilers within a city) and do not protect

public health. Although many individual sources may pose a risk below a designated threshold, the accumulation of these pollutants can be hazardous. Addressing this problem will require a general reduction in air toxics emissions across large and small sources, not just those sources for which a high local risk can be demonstrated. The commenter stated that NATA indicates that air toxics exposures are already high throughout the country.

Commenter 518 stated that, because background risk is already too high, the inhalation margin allowed for an individual source would be zero, which leads back to Congress' decision that all HAP sources should take reasonable (i.e., MACT) steps to reduce emissions.

IX.69 Comment: Commenter 472 stated that EPA must consider all ways that a HAP could harm public health or the environment. With regard to EPA's request for comment on the "appropriateness and necessity" of accounting for non-inhalation exposures, the commenter stated that §112(d)(4) refers to pollutants "for which a health threshold has been established." As this language and the legislative history make clear, it refers to pollutants that have no adverse health or environmental effects. See 5 Legislative History at 8511. Thus, §112(d)(4) necessarily requires EPA to consider all possible ways that a pollutant could affect human health or the environment. As EPA has recognized repeatedly in the past, many of the pollutants emitted by the source category are re-deposited from the atmosphere, and then contaminate soil and water for long periods of time. Moreover they bioaccumulate in wildlife and food sources, poisoning people and animals alike. See, e.g., 64 Fed. Reg. 52828, 53014 (September 30, 1999); 64 Fed. Reg. 31898, 31908-31909 (June 14, 1999); 63 Fed. Reg. 14182, 14193 (March 28, 1998); 61 Fed. Reg. 17358, 17478 (April 19, 1996) (due to bioaccumulation, mercury levels may be 10,000,000 times higher in fish than in water those fish inhabit). To evaluate whether a pollutant is a threshold pollutant and what its health threshold and ample margin of safety must be, therefore, EPA must consider all the potential health and environmental effects of deposition, persistence and bioaccumulation of that pollutant. EPA would contravene § 112(d)(4) by considering only health effects caused by inhalation.

IX.70 Comment: Commenter 515 stated that when persistent biological toxicant or metal emissions are significant, ingestion and other pathways should be considered in the risk screening.

IX.71 Comment: Commenter 465 stated that analyses like the concentration-based applicability threshold approach do not address non-inhalation exposures or adverse effects on the environment. Commenter 465 stated that allowing individual facilities to monitor the HAP backgrounds for use in their own analysis would require oversight and evaluation by State and local agencies to insure proper site selections and analytical methods and would be costly to administer and, therefore, not acceptable.

IX.72 Comment: Commenter 465 stated that the proposal did not threshold limitation guideline values for short-term exposure. Commenter 465 stated that formaldehyde has a short-term guideline value established by CAL-EPA.

IX.73 Comment: Commenters 470 and 518 stated that the proposal does not address ecological risk that may result from uncontrolled HAP emissions, especially in those areas with sensitive habitats but few people nearby to be exposed. Commenter 518 stated that metals and hydrogen fluoride have significant ecotoxicity.

Commenter 489 stated that EPA provided inadequate discussion of how environmental risks will be evaluated. The commenter added that the CAA requires that EPA consider the

environment as well as public health, and at a minimum, a facility would be required to conduct an assessment based on EPA's Guidelines for Ecosystem Assessment (1998). The commenter referred EPA to Appendix A of "Generic Assessment for Endpoints for Ecological Risk Assessment" for a detailed discussion on the legal basis from "such statutes as the CAA...that require EPA to consider and protect organism-level attributes or various taxa including fish, birds, and plants and more generally, animals, wildlife, aquatic life, and living things."

IX.74 Comment: Commenter 502 supports EPA's proposed tiered modeling approach, which begins with simple "look-up tables" and progresses to more refined facility-specific risk assessments.

Commenter 502 stated that an initial simplified tier of risk assessment, such as look-up table, nomograph, or equivalent, should be embedded in individual rulemakings. The commenter added that a guidance document should address two additional tiers of assessment: a conservative screening approach, and a flexible refined approach. Commenter 502 stated that a risk assessment guidance document should not attempt to address policy and regulatory decisions. Rather, regulatory goals and policies should be put forth within individual notice and rulemakings. Appropriate risk assessment endpoints of concern will also be established within these rulemakings.

Commenter 502 stated that refined risk assessments (3rd tier) should allow for more accurate estimates of maximum individual risk, and could accomplish this through: (1) modeling ambient exposures to an actual human receptor location; (2) use of exposure factors or models; (3) use of realistic exposure assumptions based on site-specific data (residential tenure, etc.); and, (4) use of probabilistic analysis of uncertainty and variability.

Commenter 502 stated that rulemakings that use source-conducted risk assessment should appropriately focus the initial scope of the assessment on the HAP, sources, and other parameters of concern through applicability criteria specified with the individual rulemakings.

IX.75 Comment: Commenter 515 stated that the State of Wisconsin uses a tiered approach that first allows sources to demonstrate compliance if their potential emissions, stack height, and exhaust direction are within the ranges provided in conservative lookup tables. The second tier allows facilities to provide site-specific modeling to demonstrate compliance with ambient air standards at the property line. In general, the tiered approach has worked well in Wisconsin.

IX.76 Comment: Commenters 465 and 470 stated that if EPA decides to pursue an up front risk analysis approach, it should not be a tiered approach. The development of generic risk screening approach under the Section 112(d)(4) framework will need to be conservative, and the use of a (non-tiered) conservative approach would represent the least cost to the regulated community and would be the least time consuming for States reviewing the facility's application.

IX.77 Comment: Commenter 489 stated that EPA's proposal for risk-based exemptions effectively misinterprets not only the CAA but also the guidelines and science policies established by EPA to ensure adequate protection of public health and the environment. EPA proposes a disorganized and cursory approach to implement risk-based exemptions, which falls far below the quality of risk analysis typically required by EPA across other Agency programs. The proposal does not adhere to EPA's established guidelines for characterizing human health and ecological risks. The proposal does not incorporate risk assessment guidelines for conducting multi-pathway risk assessments. The proposal does not reference EPA guidelines for

cumulative risk assessment that specifically require consideration of non-inhalation pathways. The goals of EPA's March 1995 Risk Characterization Policy of transparency, clarity, consistency, and reasonableness in Agency risk assessments apply to risk assessment practices across the Agency. The inconsistencies between EPA's proposal to provide risk-based exemptions in the MACT standard process and risk assessment guidelines undermine many regulatory programs throughout the Agency. (The commenter listed numerous programs).

Commenter 489 stated that the critical deficiency in the [risk-based] scheme reflects a fundamental misunderstanding of the use of public health and ecological risk assessments in the regulatory process. The commenter added that the hallmark of the federal risk assessment guidelines is a series of policy memos that require EPA programs to conduct risk assessments consistently across all federal environmental programs. The approaches outlined by AP&PA's white papers neglect to include risk characterization, which provides needed and appropriate information to decision makers. The approaches also do not incorporate the critical recommendation of the Commission of Risk Assessment and Risk Management to establish a framework for stakeholder-based risk management decision making. These omissions in the proposals will prevent regulatory agencies from demonstrating to the public that public health and the environment are adequately protected.

IX.78 Comment: Commenters 422, 502, and 428 stated that any risk-based approaches should be consistent with the policies in development for the residual risk rules. Commenter 502 stated that EPA should specify many of the procedures for facility-specific risk assessments in guidelines rather than in the rules, because procedures set in rules could be seen as precedent setting and could impact the residual risk program. For example, the commenter believes that EPA should specify the threshold levels by which a source would be excluded from a rule, as well as any tier 1 lookup tables, in each individual rule. In contrast, the specifics for how sources should carry out tier 2 and tier 3 risk assessments should be left flexible in guidelines now under development by EPA for the residual risk program.

Commenters 428 and 502 stated that decisions regarding the risk-based approaches in the CT rule have implications for risk-based approaches in other MACT standards. The commenters urged EPA to identify any generic issues that may impact other MACT standards and EPA programs (i.e., residual risk) and set aside enough time and resources prior to promulgation of the rules to adequately address these important and potentially precedent-setting issues.

IX.79 Comment: Commenters 518, 387, and 470 stated that the tools needed to identify sources eligible for the risk-based exemption would be the same tools necessary for a Section 112(f) residual risk assessment. It is the commenters' understanding that these tools are not yet ready for general use.

Commenter 489 stated that the cancer risk guidelines are currently undergoing public review.

Commenters 465 and 470 have serious reservations with EPA's apparent attempt to conduct an ad-hoc risk analysis for specific source categories by seeking comments on the specific elements to be included in the risk analysis and do not believe these rulemakings are an adequate forum to develop this risk analysis process. The commenters believe that any risk analysis conducted by the EPA must adhere to the risk assessment principles outlined in the Residual Risk Report to Congress.

IX.80 Comment: Commenters 387 and 470 stated that the proposal will place a very

intensive resource demand on state and local agencies to review source's risk assessments. State/local agencies may not have expertise in risk assessment methodology or the resources needed to verify information (e.g., emissions data and stack parameters) submitted with each risk assessment.

IX.81 Comment: Commenter 489 pointed out that the proposal only considers cost for the regulated source category, and not for regulatory agencies. The EPA did not consider the costs and resources associated with: (1) the public process required in reviewing/approving the proposed approaches and, if approved, making substantial changes to existing regulations; (2) the development of methods and guidance for human health and ecological risk assessments of affected sources; (3) the review by already budgetarily constrained state agencies of the assessments and assurance of adequate public participation in the process; and (4) the collection/verification of source-specific data needed for conducting risk assessments.

IX.82 Comment: Commenter 515 stated that they are concerned about the potential cost and workload that risk provisions would place on permitting authorities. The commenter added that the permitting authorities would need to either perform or verify the risk analyses, and that diverting State and local resources to focus on presumably insignificant sources would detract from efforts associated with significant sources. The commenter pointed out some of the specific items that would add burden to the State and local agencies, including data verification for background concentrations and ongoing assurance that low-risk facilities remain low-risk.

IX.83 Comment: Because EPA understands the difficulty with risk assessments, commenter 514 found it perplexing that EPA believes such analyses at the State and local levels would be an efficient way to protect public health.

IX.84 Comment: Commenters 465 and 470 noted that for EPA to conduct an up-front risk analysis, the procedure would need to be conducted using the most conservative stack parameters, with a hypothetical facility fence line to satisfy the many impact scenarios that could occur. If EPA intends to have the affected industries conduct the analysis, then EPA must consider the cost incurred by States which may lack the necessary expertise to evaluate and review these analyses. The current proposal is silent on these implementation and cost issues.

IX.85 Comment: Commenters 518 and 433 stated that the proposal is critically flawed because implementing the exemption program will require significant State resources to review risk assessments prepared by sources trying to exempt themselves from MACT. This review will require expertise in risk assessment methodology lacking in many States positioned to implement MACT standards through the title V permit program. It will also be necessary for States to verify extensive emissions and stack information used in the risk assessment to ensure that the assessment has been done properly. Because the procedures for preparing these risk assessments on a large scale basis and for assessing the potential adverse effects of the pollutants emitted (e.g. taking into account existing background and looking for a threshold level for carcinogens) are untried and will require extensive debate and review to launch, even more time and resources will be needed. Commenter 518 expressed concern about exempting a facility based on limited emission data if EPA established a subcategory listing low-risk sources.

IX.86 Comment: Commenter 445 expressed concern that the risk-based delisting would be resource intensive.

IX.87 Comment: Commenters 465 and 470 stated that if EPA intends to have the affected industries conduct the analysis, then EPA must consider the additional cost incurred by

smaller sources to do the analysis.

IX.88 Comment: Commenter 515 stated that title V permits seem to be the obvious implementation tool, and that title V permits could provide enforceable limitations, appropriate recordkeeping requirements, and periodic review upon renewal. The commenter added that since the rule would apply only to major sources, title V permits already are required and would not be an added burden. The commenter added that title V could be used to implement applicability cutoffs, but that the workload involved with the options requiring modeling, ambient monitoring, or other means to establish background concentrations would be a hindrance to any implementation mechanism.

The commenter stated that with respect to potential risk-based provisions, monitoring is more useful for demonstrating non-compliance than compliance because the regulation would apply to potential emissions under any weather conditions, whereas monitoring reflects current weather and emission conditions.

IX.89 Comment: Commenter 489 stated that risk-based exemptions are such an implausible interpretation of the CAA that states do not even have the authority to grant them under their title V permit programs. Therefore, the commenter is not aware of any approach to ensure that emissions remain below specified levels. MACT standard applicability is the gate-keeper for being subject to a Title V operating permit. Once a source is exempt from a MACT standard, it would be exempt from the monitoring, reporting and recordkeeping requirements needed to demonstrate compliance.

IX.90 Comment: Commenters 387 and 470 stated that it is evident that the proposed approach to risk-based exemptions would require extensive debate and review in order to launch, which will further delay promulgation of the remaining MACT standards.

Commenters 387 and 470 stated that delays could be exacerbated by litigation following legal challenges to the rules, and such delays would trigger the MACT hammer, which would unnecessarily burden the State and local agencies and the industries. The commenters concluded that, obviously, further delay is unacceptable.

IX.91 Comment: Commenter 489 noted that the Inspector General recently found that EPA is nearly two years behind in fulfilling its statutory responsibilities for implementing Phase 1 MACT standards. This delay potentially harms the public and environment. The inclusion of risk-based exemptions in 10-year MACT standards will only further delay this process.

IX.92 Comment: Commenter 518 stated that the risk assessment exemption could significantly delay compliance with MACT for sources trying unsuccessfully to opt out using the exemption.

IX.93 Comment: Commenter 425 supported efforts to lower the costs to industry but expressed concern about the legal viability of the risk-based approaches discussed in the proposal. The concerns are practical and acute, in that if the rules are invalidated the MACT "hammer" could fall, subjecting sources to case-by-case MACT determinations. Such a result would not serve the interests of industry or any other stakeholders.

IX.94 Comment: Commenter 386 stated that EPA should have sufficient time to fully consider both the risk-based approaches for the CT source category and the GTA petition for delisting the source category. The target date for promulgation (August 30, 2003) and the deadline for Part 2 112(j) permit applications for the CT source category do not afford EPA sufficient time to consider these issues. The commenter noted that the MACT source categories

included in the April 28, 2004, bin include the risk alternatives (like the CT MACT), and the commenter requested that EPA adopt the April 28, 2004 deadline for the Part 2 112(j) permit applications for the CT source category.

IX.95 Comment: Commenter 470 stated that the proposed approaches will jeopardize expeditious promulgation of remaining MACT standards. The commenter noted that according to a recently proposed EPA rule regarding section 112(j), the regulated community and State and local agencies would have to proceed with Part 2 permit applications, followed by case-by-case MACT, if EPA misses the newly agreed-upon MACT deadlines by as little as two months. This would be time consuming, costly, and burdensome for both regulators and the regulated community.

IX.96 Comment: Commenters 489 and 465 endorsed the comments submitted by STAPPA/ALAPCO.

Commenter 483 supported the comments presented by STAPPA/ALAPCO at the January 29, 2003 public hearing on the combustion turbines rule.

IX.97 Comment: Commenter 489 included multiple attachments, including the following:

Attachment 1--Congressional Record, E2383, November 11, 1999

Attachment 2--EPA Science Policy Council, Policy on Evaluating Health Risks to Children

Attachment 3--EPA Science Policy Council, Memorandum on EPA Risk Characterization Program, March 21, 1995

Attachment 4--EPA Science Policy Council, Elements to Consider When Drafting EPA Risk Characterizations, March 1995

Attachment 5--EPA Science Policy Council, Policy for Risk Characterization, February 1995

Attachment 6--EPA Science Policy Council, Policy for Risk Characterization, March 1995

Attachment 7--EPA Science Policy Council, Memorandum on New EPA Policy on Evaluating Health Risks to Children, October 20, 1995

Attachment 8–Fact Sheet, Report to Congress on Residual Risk

Attachment 9–Statement of John D. Graham, Ph.D., Director, Center for Risk Analysis, Harvard School of Public Health, October 14, 1999

Attachment 10–Statement of Lee P. Hughes, Vice President, Corporate Environmental Control, Bayer Corporation, on behalf of the American Chemistry Council, before the Senate Environment and Public Works Committee on Clean Air Act Residual Risk, October 3, 2000.

IX.98 Comment: Commenter 489 stated that EPA provided inadequate information on the selection of HAP of concern from combustion turbines based on mass of emissions. For example, the proposal does not provide information on why dioxin, numerous metals, and other HAP were not considered. For metals, the commenter recommended that EPA refer to their June 2002 Guidance for Characterizing and Ranking Metals (EPA/630/P-02/003A) to determine whether they should or should not be considered in the risk assessment.

IX.99 Comment: Commenter 470 stated that the proposed case-by-case, risk-based approach is unnecessary because EPA has already proposed to limit applicability to CTs located

at major sources of HAP and has also proposed size-based applicability limits. The size-based applicability limits should be adequate for addressing both the size of the HAP source and the cost-effectiveness of the requirements.

Response: The preamble to the proposed rule requested comment on whether there might be further ways to structure the rule to focus on the facilities which pose significant risks and avoid the imposition of high costs on facilities that pose little risk to public health and the environment. Specifically, EPA requested comment on the technical and legal viability of three risk-based approaches: (1) an applicability cutoff for threshold pollutants under the authority of CAA section 112(d)(4); (2) subcategorization and delisting under the 2-190 authority of CAA sections 112(c)(l) and 112(c)(9),); and (3) a concentration-based applicability threshold.[1] The EPA indicated that it would evaluate all comments before determining whether either approach would be included in the final rule. As presented above, numerous commenters submitted detailed comments on these risk-based approaches.

Based on EPA's consideration of the comments received and other factors, EPA has decided not to include the risk-based approaches in the final rule. The risk-based approaches described in the proposed rule and addressed in the comments EPA received raise a number of complex issues. In addition, EPA must issue the final rule expeditiously, because the statutory deadline for promulgation has passed and EPA has agreed to a binding schedule in a consent decree entered in Sierra Club v. Whitman, Civil Action No. 1:01CVO1537 (D.D.C.). Given the range of issues raised by the risk-based approaches and the need to promulgate a final rule expeditiously, EPA believes that it is appropriate not to include any risk-based approaches in the final rule. Nonetheless, EPA expects to continue to consider risk-based approaches in connection with other proposed NESHAP where EPA has described and solicited comment on such approaches. Finally, while EPA is not including risk-based approaches in the final rule, EPA has included a number of other measures that it expects will reduce the costs and burdens on the affected sources.

X. OTHER

A. Startup/Shutdown

X.A.1 Comment: One commenter (438) stated that a maximum period for startup and shutdowns should be defined in the proposed rule, with the possibility of the Administrator allowing a longer period on a case-by-case basis.

Response: It is believed that this comment was made because the proposed rule did not

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[1]See 68 FR 1276 (January 9, 2003) (Plywood and Composite Wood Products Proposed NESHAP) and docket number A-98-44, Item No. II-D-525 (White papers submitted to EPA outlining the risk-based approaches).

have a requirement for a startup, shutdown, and malfunction plan (SSMP). The final rule clarifies that a SSMP is required and the EPA believes that this satisfies the commenters concern.

X.A.2 Comment: Four commenters (422, 437, 438, 519) noted that facilities are not required to prepare a SSMP as specified in the Part 63 General Provisions. Commenters 422 and 519 recommended that EPA modify the General Provision references to be consistent with the fact that the proposed rule does not require SSMP. Table 8 should be revised as follows:

> • 40 CFR 63.6(e)(1)(i): should clarify that emission limitations and operating limitations do not apply during SSM periods.
> • 40 CFR 63.6(e)(1)(ii): eliminate the reference to the SSM plan
> • 40 CFR 63.10(c)(15): eliminate reference to SSM plan by noting "No" under applicability. Note: references for 63.10(c)(2-15) were excluded from the General Provisions Table 8.

Response: The EPA agrees with the commenters that the rule had conflicting requirements for startup, shutdown, and malfunction. As stated in the response to comment X.A.1, the final rule clarifies that sources have a plan for minimizing emissions during startup, shutdown, and malfunctions. The General Provision references in final rule have been revised accordingly.

X.A.3 Comment: One commenter (440) advised that EPA should make clear that the MACT standards do not apply during startup, shutdown, or malfunction. The commenter is concerned that EPA's general MACT provision for operations and maintenance incorporated by reference in the Proposed Rule is phrased in a manner that could be misconstrued for limited use, limited capacity LPC CTs operated as peaking units. The general MACT provision for operations and maintenance requires that:

> "At all times, including periods of startup, shutdown and malfunction, owners or operators shall operate and maintain any affected source, including associated air pollution control equipment, in a manner consistent with good air pollution control practices for minimizing emissions at least to the levels required by the standards."

The EPA is urged to clarify in the preamble to the current rulemaking that the provisions "*minimizing emissions to at least to the levels required by the standards*" does not impose the new standards proposed in this rulemaking upon LPC CT peaking units, as well as other types of machines, during SSM.

Response: The EPA believes that § 63.6105(a), which states that "you must be in compliance with the emission limitations and operating limitation which apply to you at all times except during startup, shutdown, and malfunctions," adequately addresses the commenters concern. Thus, EPA is not changing the NESHAP in response to this comment.

B. Dual Fuel Units

X.B.1 Comment: Four commenters (422, 431, 484, 502) stated that EPA should consider dual fuel combustion turbine operation and the impacts of byproduct fuel use in the process of establishing MACT limitations. One commenter (431) recommended that EPA provide a similar subcategory as provided for digester and landfill gas for units firing process gaseous and liquid byproduct fuels. If the byproduct fuel would not impact catalyst performance, EPA should allow the owner/operator to petition for a site-specific CO reduction or specific emission rate for either CO or formaldehyde, taking into account the impact of the byproduct fuel on CT and catalyst emissions and performance.

Response: The commenters did not provide any supporting information to indicate that turbines would not be able to meet the emission limitations while firing byproduct fuels. In the absence of any supporting detail, EPA is not changing the NESHAP in response to this comment.

X.B.2 Comment: Five commenters (443, 460, 475, 482, 484) disagreed with EPA's assumption that companies will take a 50 hour limit to avoid cost of installing CO catalysts. Commenter 443 recommended that EPA increase the limit for limited use to 876 hours. Commenter 460 noted that most dual fuels commonly permitted for operation of 30 days (720 hours) of liquid fuel operation, while some are permitted for 120 days or more. Two commenters (460, 482) said that EPA should not require any controls on dual-fueled units. Commenter 484 observed that a much greater percentage of fuel burned is diesel than EPA's estimate of 5 percent. The natural gas supply is limited in some areas.

Commenter 475 stated that EPA's assumption that natural gas supply will be adequate and cost competitive with diesel fuel is incorrect when in fact natural gas curtailments can be expected to occur often in a volatile fuel market. The commenter recommended that EPA provide a 10 percent annual capacity factor exclusion for dual fuel units when operating in the diffusion flame mode to allow for the use of fuel oil as backup fuel. The commenter also recommended EPA exempt operating hours while firing a backup fuel that are attributed to compliance testing and performance testing from the calculation of annual capacity factor exclusion. The commenter also suggested that EPA address dual fuel CTs by not requiring emission limitation for new dual-fuel CTs while operating in the diffusion flame mode and require only a one-time performance test for such CTs while operating in the lean premix mode to demonstrate compliance with a 5 ppm CO limit. The commenter believed that EPA needs to be consistent in its treatment of new and existing DFC CTs in this rule.

Two commenters (508, 509) agreed that EPA should address and resolve compliance and monitoring issues for dual fuel CTs.

Response: The subcategory for limited use units is not included in the final rule, thus, the 50 hour exemption for backup fuel firing is not available. The rationale for not including a subcategory for limited use units is given in the response to comment I.C.1.1. As discussed in

the response to comment IV.A.8, new subcategories were created for natural gas fired units with limited oil backup and oil-fired units. The formaldehyde emission limitation and operating limitations are the same for both natural gas and distillate oil fired units, thus the type of fuel being burned in the turbine should not present any compliance monitoring issues. Therefore, the commenters' concerns regarding compliance and monitoring issues for dual fuel units have been addressed.

The EPA does not agree with the comment that it should not require any controls on dual-fueled units. There are existing dual-fuel units equipped with oxidation catalyst control and therefore the MACT Floor for those units is the level of emission control achieved through the use of oxidation catalyst control.

X.B.3 Comment: Four commenters (431, 474, 508, 509) said that the limited use subcategory should cover periods of time when a limited use backup or secondary fuel is being utilized.

One commenter (443) agreed with EPA's statement of nonapplicability for diffusion mode of existing dual fuel units and stated that this should be made more clear in the rule. The commenter also requested clarification in the rule that there is no emission limit for any mode in which a unit operates for less than the period defined in the limited use definition.

Response: The EPA has evaluated the comments received on the limited use subcategory and has decided to not develop a limited use subcategory. The final rule does not have emission limitation requirements for existing turbines, reducing the burden on existing turbines with low capacity factors, which was a major concern of the commenters.

X.B.4 Comment: Two commenters (427, 460) remarked that EPA's declaration that diesel fired turbines cannot be operated in the lean premix mode is a misstatement. While some manufacturers, on some models, only offer liquid fuel capability in diffusion flame mode, other manufacturers have offered the dual fuel option on LPC turbines since the mid-1990's. Commenter 427 stated that the standard should be modified because of the dual fuel capability of CTs. The commenter noted that EPA has no data to represent LPC liquid fuel operation and therefore cannot determine an appropriate standard.

Response: At the time the NESHAP was proposed, EPA was not aware of the availability of diesel fired turbines that operated in the lean premix mode. The EPA has since contacted several turbine manufacturers in an attempt to obtain more information about these units, and two manufacturers confirmed that they do offer diesel firing while operating in lean premix mode. The commenter is correct that EPA has no emissions test data for LPC oil-fired units, however, information provided by the manufacturers indicated that their emission guarantees for CO and hydrocarbons were similar for both natural gas and diesel. Also, testing on dual fuel diffusion flame units shows that formaldehyde emissions are actually lower for distillate oil firing. Therefore, EPA has established an emission standard for LPC oil-fired units in the final rule.

X.B.5 Comment: Three commenters (422, 431, 502) said that the impact of firing diesel fuel on catalyst activity should be considered and a lower percent removal requirement established for that fuel.

Response: Catalyst vendors indicate that catalysts installed on turbines that burn distillate oil can achieve the same CO and HAP percent reduction as those installed on natural gas fired turbines. The typical vendor guarantee period is the same for either fuel. Therefore, the EPA does not believe it is appropriate to establish a lower percent removal requirement for oil-fired turbines.

C. Oil Firing

X.C.1 Comment: One commenter (473) said that EPA should establish a separate MACT category for CTs that burn only oil, should identify a MACT floor, and consider collateral emission increases of PM, SO_3, and H_2SO_4.

Response: The EPA agrees that a separate MACT category should be established for CTs that burn only oil. The EPA has created subcategories for DFC units burning distillate oil and LPC units burning distillate oil in the final rule and identified the MACT Floor for those subcategories. Catalyst vendors were consulted and they indicated that collateral emission increases of PM, SO_3, and H_2SO_4 from oil fired units equipped with oxidation catalyst control would be small. According to the vendors, SO_2 emissions from both natural gas and distillate oil fired turbines are very low, therefore the impact on PM emissions would be very low. In addition, the catalyst can be installed at a location where the temperature and the residence time would help to minimize the potential for SO_3 formation.

X.C.2 Comment: One commenter (460) expressed the view that there should be no controls required for oil operation, based on the fact that formaldehyde emissions are lower on oil operation compared to natural gas operation.

Response: The EPA does not agree with the commenter that there should be no controls required for oil operation, because formaldehyde is not the only HAP of concern. It may be lower for oil operation but other HAPs are higher (metals for example).

X.C.3 Comment: Three commenters (421, 460, 473) observed that EPA did not consider the ability of the oxidation catalyst to convert fuel bound sulfur into sulfuric acid mist. The formation of sulfuric acid over the catalyst will result in the release of a new air toxic. Commenter 473 stated that an oxidation catalyst would reduce emissions of formaldehyde, CO, and VOCs, but would increase emissions of PM_{10}, $PM_{2.5}$, SO_3, and H_2SO_4. The commenter provided an estimate from a catalyst vendor that 12 percent of SO_2 will be oxidized to SO_3 across the catalyst and ultimately to H_2SO_4.

Two commenters (421, 460) stated that in a facility already equipped with SCR, the inclusion of an oxidation catalyst would very likely increase the PM emissions.

Response: The EPA consulted catalyst vendors and they say the oxidation of SO_2 to acid mist can occur over a catalyst. However, SO_2 emissions from both natural gas and distillate oil fired turbines are very low, therefore the impact on PM emissions would be very low. In addition, the catalyst can be installed at a location where the temperature and the residence time would help to minimize the potential for SO_3 formation.

D. Duct Burners

X.D.1 Comment: One commenter (477) said that waste heat recovery units should be considered emission control for gas fired CTs. The commenter suggested the creation of "operating scenarios" for CTs with duct burners. If a turbine is equipped with a duct burner but the owner chooses not to operate the duct burner because of reduced demand for boiler or process heater output, the compliance requirements would be as stated in CT MACT. However, when duct burner is in operation, the owner/operator should be allowed to meet the control requirements of this MACT by meeting the requirements of the proposed Boiler and Process Heater MACT or by meeting the requirements of 40 CFR part 63 subpart SS (Standard for Closed Vent Systems, Control Devices, Recovery Devices, and Routing to a Fuel Gas System or Process).

Two commenters (437, 519) also said that routing a turbine exhaust stream to a boiler or process heater should be considered an acceptable control technology. No additional control, monitoring, or reporting requirements should apply to the boiler or process heater.

Response: The EPA does not agree that routing a turbine exhaust stream to a boiler or process heater should be considered an acceptable control technology. The commenters have not provided any supporting information to indicate that routing the turbine exhaust stream to a boiler, process heater, or other waste heat recovery unit would control HAP emissions.

E. Other

X.E.1 Comment: One commenter (474) stated that EPA should reconsider the need for MACT standards for stationary CTs. According to the commenter, the GTA study confirms HAP emissions from virtually all gas turbines present health risks well below the statutory delisting criteria. A November 20, 2002 Air Daily publication reported that formaldehyde emissions pose such a minimal risk that they do not warrant a rulemaking. EPA has begun reviewing a possible reduction in the formaldehyde toxicity value. Based on preamble, relatively few CTs will actually have to install MACT-specific controls. The national benefit (tpy reduction in HAP emissions) may be significantly overstated. The 8,760 hr/yr assumption is unrealistically conservative. The 95 percent CO reduction may also be unachievable.

Response: The commenters' main points are based on the fact that CTs pose little risk and therefore should not be established. The MACT standards are based on the application of maximum achievable control technology without the consideration of risk. Risk based standards will be developed for CTs at a later date under the residual risk program. Therefore EPA will

continue to develop and promulgate the CT MACT standards.

The EPA agrees with the commenter regarding the 8,760 hours/yr used to calculate emissions reductions and will use a 20 percent capacity factor for simple cycle turbines and a 60 percent capacity factor for combined cycle turbines for the final rule.

The EPA continues to believe that 95 percent CO emission reduction is achievable if the system is adequately designed. However, since the final rule does not the 95 percent CO emission reduction emission limitation, the point is now moot.

X.E.2 Comment: Four commenters (421, 431, 487, 502) remarked that EPA did not adequately address the feasibility of retrofit controls on certain units. One commenter (487) cited the example of a once through steam generator (OTSG) that has no space for CO oxidation catalyst bed; therefore, addition of CO oxidation catalyst control would mean replacement of OTSG with a new HRSG. Commenter 421 stated that the addition of a catalyst system would impact efficiency, due to increased backpressure, resulting in potentially increased emissions to obtain the same power output.

Commenter 502 recommended that when a CT subject to the control requirements of the rule fails to meet the 43 ppb formaldehyde level, and an existing HRSG cannot be retrofit with an oxidation catalyst due to physical or design constraints, the catalyst installation should not be required until the existing HRSG is replaced or reconstructed. In the alternative, EPA should offer a petition process for these sources to receive an alternative emission limitation.

Commenter 431 also observed that retrofit of catalysts into existing HRSGs could pose significant and costly problems which could result in a lesser performance than for a new design. EPA should reduce the CO reduction requirement for retrofit installations on existing LPC CTs. There should also be an option for the affected source to petition the EPA for a site specific alternative emission limitation based on the attainable emissions rate or CO reduction achievable on a long term basis for retrofit installations on existing sources. The option to petition for a site specific alternative emission limit should also be provided for those cases where retrofit installation of an oxidation catalyst into existing equipment is technically infeasible.

Response: The EPA agrees with the commenter that there may be some issues with the feasibility of retrofit controls on certain units. However, as discussed in the response to comment IV.B.1, the final rule does not have any emission limitations for existing units; thus, these comments are moot.

X.E.3 Comment: One commenter (472) observed that HAP emissions from sources burning natural gas are enormously different from sources burning other fuels such as diesel. The commenter questioned EPA's argument that the summation of emission factors for various HAP for different fuels is comparable. The commenter also said that EPA does not explain what the summation of emission factors means or how it might be relevant to EPA's floors for any HAP.

Response: The EPA agrees with the commenter that the composition of HAP emissions from sources burning natural gas are different than from sources burning diesel fuel. Uncontrolled formaldehyde emissions are in general lower as a result of the combustion of distillate oil than for natural gas. Other differences in emissions between natural gas and distillate oil include higher levels of pollutants such as PAH and metals for stationary CTs burning distillate oil. The EPA agrees that the summation of emission factors for various HAP for different fuels may be different. As discussed in the response to comment IV.A.8, due to the differences in HAP emissions, subcategories based on fuel were established for both DFC and LPC turbines.

X.E.4 Comment: One commenter (425) encouraged EPA to supplement its Emissions Database to the extent possible with additional data, assuming that it can do so without jeopardizing its ability to meet the strict deadline it is under to finalize the rule.

Response: At proposal, EPA had limited emissions data for stationary combustion turbines. In the preamble to the proposed rule, EPA requested HAP emissions test data from stationary combustion turbines. As a result of this request, EPA received new data in the form of several test reports during the comment period and has more than doubled its total data set.

X.E.5 Comment: One commenter (439) suggested that EPA provide a mechanism to allow facilities to make other, more cost and/or energy effective HAP reductions on processes other than the turbine system at facilities where one or more turbines are subject to the rule simply because the facility is a major source due to unrelated processes.

Response: The EPA does not agree with the commenter. The CAA does not allow HAP emission trading across all categories at a site. Therefore this suggestion was not implemented in the final rule.

X.E.6 Comment: One commenter (429) disagreed with EPA's statement in the proposed rule that acetaldehyde is present in natural gas fired turbine exhaust.

Response: Emissions data collected by EPA show that several HAPs are present in the stationary CT exhaust, including acetaldehyde.

X.E.7 Comment: One commenter (421) asserted that EPA, without rationale, has established an arbitrary and unwarranted distinction between gas turbines and RICE, with the potential to disenfranchise an entire industry as well as technologies that are among the most environmentally benign for power generation. The commenter urged EPA to reconsider its rulemaking.

Response: The EPA is required by the CAA to regulate stationary gas turbines.

X.E.8 Comment: One commenter (460) requested that the word "transients" be added to the periods in which compliance is not required as follows: " . . . except during startup,

transients, shutdown, and malfunction." Similarly, one commenter (427) said that § 63.6105(a), should read "except during startup, shutdown, transient/off-load, and malfunction."

Response: The commenter did not provide any clarifying information explaining why compliance should not be required during transient operation of the turbine. The EPA knows of no reason why compliance should not be required during transient operation. As a result, EPA is unable to address the concern directly and is not changing the NESHAP in response to this comment.

X.E.9 Comment: Three commenters (422, 437, 519) recommended that the following modifications/corrections should be made to Table 8 General Provision applicability references:

• In Table 8 EPA indicates that for 40 CFR 63.6(b)(3) that this doesn't apply to Subpart YYYY and notes that compliance is required by startup or effective date. EPA should change the "No" to "Yes." Section 63.6(b)(3) is important because in the case that the final rule is more stringent than the proposed rule, the regulated entity will have three years to comply with the more stringent regulation but still must be in compliance with the proposed rule during the three year period immediately after the effective date. This is a practical necessity. If the final rule is more stringent than the proposed rule the regulated entity may not have sufficient time to add additional facilities and execute additional projects if the final rule is significantly more stringent than the proposed rule.

• For 63.8(c)(1)(ii) EPA should note "Yes," not "No," in the applicability column. This refers to compliance with operation and maintenance requirements; EPA incorrectly describes this citation as "SSM not in SSMP." In addition, 63.8(c)(1)(iii) should be noted as "No," not "Yes," in the applicability column. This refers to the SSM plan. Apparently EPA switched the subject and applicability notations for these two citations.

• The Agency notes "No" for 63.9(c) on allowing a request for a compliance extension and notes "compliance extensions do not apply to new or reconstructed sources." The actual regulatory reference doesn't limit the compliance extension to new or reconstructed sources so it is unclear why the Agency would not allow for a request for an extension of compliance. Table 8 should note "Yes" for applicability. Consistent with this the Agency should note "Yes" for applicability of 63.10(d)(4) relating to progress reports on compliance extensions.

Response: The EPA agrees with the first and third change suggested by the commenter and has made the changes to the final rule. The second change was not made because sources are required to have a SSMP.

X.E.10 Comment: One commenter (502) said that there are inconsistencies in indication of applicable requirements between the proposal and General Provisions. Numerous changes to Table 8 were suggested. See attachment B of comment # 502 for a complete list of the changes.

Response: As a result of this comment, EPA reviewed all of Table 7 and corrected any

inconsistencies in the indication of applicable requirements between the rule and the General Provisions.